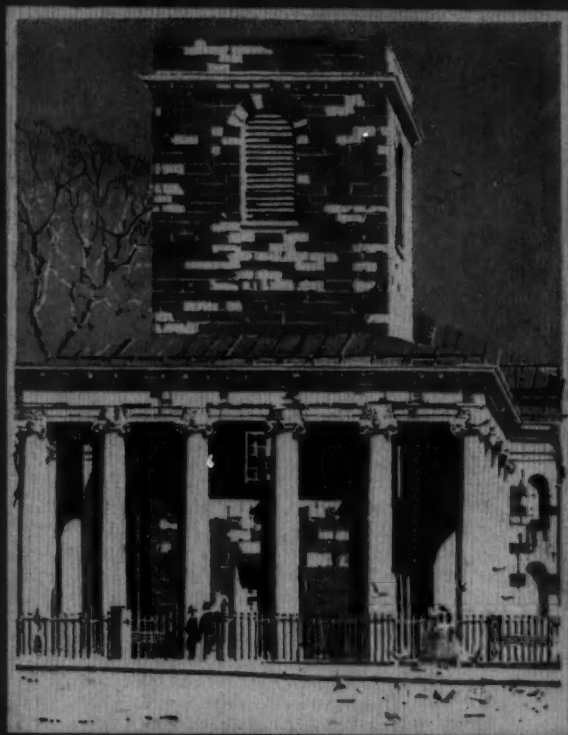


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# BOOK DEPARTMENT

## The Antique Use of Terra Cotta

**R**ESearch into the architecture of antiquity and study of the materials of which buildings were constructed and of the methods by which the materials were used provide matter of interest to the modern world. Along with study of the buildings of ancient Greece and of the various parts of the Mediterranean littoral which were influenced by Greek civilization and refinement there has come a new idea of the richness which these antique buildings possessed. We are likely to think of the structures of Greek antiquity as being austere and severely colorless—possessed of surpassing merit in the way of structural design, but of materials which were pale and generally cold. Nothing could be farther from the truth—and enough of the fragments of antique buildings have come down to us to afford some idea of the strong, vivid character of structures in which terra cotta in color was used in waterspouts, cornices, antefixes, and other details, but all this handled with Greek restraint, and with an eye to the harmony and symmetry of the building as a whole, which would be injured by the undue prominence of any detail to mar architectural balance.

In this volume Mrs. Van Buren studies the use of terra cotta in Sicily and the various colonies and islands which comprised Magna Græcia during the period which closes with the ending of the fifth century B. C. Webster defines "revetment" as "a facing of stone, concrete, fascines, or any other material to sustain an embankment; also a retaining wall," but the term is used here in a much wider sense, and is made to describe a facing for any part of a building and even for a roof, and not only is a covering for exterior walls but for facing interior walls as well. The Greeks, for all their devotion to purity of line and consistent balance of decoration, possessed respect for the practical. Greece and the islands which dot the Ægean sea abound in quarries which supply marble of qualities excellent for building, but Sicily and certain parts of the Italian mainland much influenced by Greece furnish no marble, and the limestone which the soil affords being coarse did not lend itself to the sculptural treatment which Greek taste prescribed. Thus in these districts, as in Etruria where there is likewise no marble, there grew up a wide use of terra cotta, easily worked and capable

of taking any desired form of color decoration. The ravages of time—during the many centuries which have elapsed between that day and this have meant the destruction of much of what the antique bequeathed to the modern world, and the quarrying of ruins which has been going on for centuries has resulted in the scattering of these relics of the past. None the less, patient search brings to light, chiefly in museums in various parts of Europe, enough remains of ancient terra cotta to make possible the visual reconstruction of buildings such as existed in that distant period.

"Some faint idea of the glowing splendor of these archaic temples may be gained from a study of the abundant material found in the *temenos*, Syracuse, and still more from the really stupendous slabs which clothed the rather friable stone of the edifices at Selinus. One cannot but marvel at the fertile imagination of the artists who produced such a variety of forms, designs and coloring in spite of rigid rules which curbed their fantasies and a severely restricted range of colors which limited them to the use of red



Lateral Simæ, Metapontum, Temple of Apollo  
Illustration from "Archaic Fictile Revetments in Sicily and Magna Græcia"

merging into a reddish purple and black fading into rusty brown on a cream ground, for it was only in the fifth century that the black and dead white scheme of decoration was introduced. Yet so skillfully did they combine or diversify the tones and motives, so cleverly did they gauge the play of light and shade, that all monotony is avoided and at first one hardly realizes with what scanty materials such a harmonious blending is effected." Theirs was a judicious use of resources.

Analysis of the illustrations which form so valuable a part of this work shows that the designs of all this architectural terra cotta are after all comparatively simple and are made up chiefly of familiar motifs—the tongues, guilloches, lotus blooms, mæanders, sphinxes and lions' heads in countless arrangements and combinations, and in this may be found an instance of the real issue of all Greek art—the happy faculty of using only a few motifs or types employed in a perfect way, obtaining beautiful results by the simplest of means.

**ARCHAIC FICTILE REVETMENTS IN SICILY AND MAGNA GRÆCIA.** By E. Douglas Van Buren. 168 pp., 19 half-tone plates, 7½ x 10 ins. Bound in cloth, with cover ornamented in self color. Price \$8. E. P. Dutton & Co., New York.

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Text and 76 plates, 10½ x 15½ inches.

Price, \$7.50

## REDEEMING OLD HOMES

By Amelia Leavitt Hill

A valuable work on the alteration and restoration of country houses. Particular attention has been given to the planning of interiors and to the decoration and furnishing of the different rooms.

160 pp., 5½ x 8¼ inches.

Price, \$3

## COLONIAL LIGHTING

By Arthur H. Hayward

The important subject of lighting Colonial houses is studied. The various forms of lighting fixtures used during early and later Colonial times are illustrated and described, with particular emphasis given the later period.

159 pp., 6 x 9 inches.

Price, \$7.50

Character in any building is largely dependent upon the design of its interior architecture and the handling of its decorations. The growing importance of this part of an architect's practice warrants close study of interior design and decoration with which these works deal.

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**FILING DEPARTMENT OPERATION AND CONTROL.** By Ethel E. Scholfield. 318 pp., 5½ x 8½ ins. Price \$3. The Ronalds Press Company, New York.

THE importance of having an adequate filing system and the necessity of properly administering such a system are great in a business of any kind. Any executive or professional man knows the vexation and sometimes the embarrassment occasioned by the impossibility of finding quickly some important letter, contract or other document, and it has been well said that there exists no detail of office management which acts as a more infallible test of the administration's capability than the ease—or the lack of it—with which any document or piece of information once filed may be had. So great is the importance of a filing department that in many concerns what might seem to be a great price is paid to maintain it in the best of condition, for besides the cost of considerable floor area which is often necessary and the added cost of suitable filing equipment there is the cost of employing trained and capable file clerks and sometimes their assistants.

Study of filing systems and familiarity with their operation are indicated in this thoughtfully prepared work which points out the relations of the filing department to the executive, to department heads, to the library, the mail and messenger service, the research staff, etc. In the preparation of the volume the author has omitted much which is too obvious to require presentation, and has emphasized essentials which are not always seen to be essentials, important as they are.

**HOUSE PAINTING, GLAZING, PAPER HANGING AND WHITEWASHING.** By Alvah Horton Sabin. 160 pp., 5 x 7¼ ins. \$1.50 net. John Wiley & Sons Co., Inc., New York.

IN the preface to this work, which now appears in its third edition, the publishers suggest that the volume is intended primarily for the "householder" or the amateur who desires to mix his own paints, and the entire book is written in language which is non-technical, in order to avoid confusing the reader.

All the branches of what is ordinarily considered the painting business are covered: Materials, Pigments, Care of Paint Brushes, Mixing Paints, Exterior Painting, Interior Painting, and Varnishing are dealt with, and later chapters treat of Floor Finishes, Glazing, Papering, Whitewashing and Kalsomining.

**SMALL HOUSE DESIGNS.** Collected by the Community Arts Association, Santa Barbara, California. 152 pp., 10½ x 10¼ ins. Price \$5. Sales Agent: H. S. Elliott, 25 Pacific Avenue, Piedmont, California.

THE Community Arts Association has succeeded admirably in what has undoubtedly been an effort to stimulate interest in home building in general and to further the actual erection of homes in its locality. Some months ago the association announced a "small house competition," the designs submitted to be for buildings of not more than five rooms, placed upon an inside lot 50 feet wide and 150 feet deep. There were certain other conditions laid down, the chief being that the cost must not be over \$5,000. The enthusiasm with which contestants entered the competition may now be judged from the volume of designs which has been issued.

As might be expected, many of the designs are for homes in what is popularly known as the "Spanish-Californian type," the architecture of the early Spanish set-

tlers, developed for the most part in plaster or stucco, and admirably suited to the climate and living conditions of the locality. Other houses are designed in the modern English cottage style and intended to be built of various materials, while other houses are intended to be built of frame and covered with clapboards. The plans of the houses are fully as interesting as their exteriors.

The association's aim doubtless is to secure the actual construction of buildings, and to make this as easy as possible considerable information is given on home building in general—"Hints to Home Makers,"—which includes some considerations on the ownership of property and advice on building which smooths away some of the difficulties presented by questions of financing.

It might be possible to build any one of the houses illustrated in the vicinity of Santa Barbara for \$5,000, but we are not at all certain that it could be done for that amount in the vicinity of New York or Boston. Many of the designs, however, are so good that, wholly apart from the question of cost, the volume would be well worth the price to anyone interested in houses of this size and character.

**CARPETS AND RUGS; How They Are Made; How to Select Them; How to Care for Them.** By Otis Allen Kenyon. 168 pp., 5½ x 8¼ ins. The Hoover Company, North Canton, Ohio.

THERE is no detail connected with the building and furnishing of the interior of a house regarding which the average householder is so densely ignorant as he is upon the subject of the carpets or rugs, of one kind or another, which cover the floors. Many people of course know the difference between "Brussels" and "Axminster" carpets, and appreciate the wide difference between both these and "Ingrain," but much more than such elementary knowledge will generally be looked for in vain. Understanding of such matters as the difference between the density and the height of the pile, for example, or that between the carpet's warp and woof is usually entirely non-existent.

This volume has been prepared as a source from which one may gather such information as would promote a more intelligent selection and use of carpets. It begins, logically, with a brief historical sketch covering the origin and the development of rug and carpet making, particularly in Europe and the United States. It then takes up the various kinds or types of carpets, describes each and the mechanical processes by which it is made, and follows the processes through a carpet mill or factory from the time the fleece comes from the back of a sheep until it is ready for use as a finished carpet. Useful chapters are devoted to suggestions regarding the choice of oriental rugs,—how to detect "doctoring" or use of aniline dyes, or how to tell when a rug has been washed. Another part of the work is given up to suggestions for the selection of a rug of modern make—low priced, medium priced, or high priced—and important hints are given which the purchaser would do well to bear in mind.

A most valuable part of the book is that devoted to the "Care and Cleaning of Carpets and Rugs," important since the wear which carpets and rugs give is certain to be in proportion to the care which they have received. Considerable attention is devoted to the cleaning of rugs by various mechanical methods.

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**COTTAGES, FARMHOUSES AND OTHER MINOR BUILDINGS IN ENGLAND OF THE 16TH, 17TH AND 18TH CENTURIES.** By Louis Conrad Rosenberg. 102 pp., 10½ x 13½ ins. Price \$15. The Architectural Book Publishing Company, New York.

**S**TUDY of domestic architecture brings to light no type which is more enduringly beautiful than the different styles which are grouped under the general heading of "English." No type of building for domestic uses is quite so popular in America today, and if one were to assemble a collection of illustrations showing American domestic buildings, large and small and from different parts of the country, it would be found that by far the greater number showed the use of types not Italian, nor French, nor Dutch, notwithstanding the beauty and excellence of all these, but of types which are definitely and characteristically English.

This strongly marked preference for English styles cannot be said to be the result of any historic or sentimental association of the types with American tradition; it is due wholly to the suitability of the styles to American life, conditions and customs. This quality of suitability includes much more than the dignity and grace which the types possess; it includes the high degree of domestic comfort which they afford, and also an unusual flexibility as to scale and plan, for the English home is scarcely more beautiful when worked out in the development of a large manor house of the Queen Anne type than when used for the interpretation of a cottage or a farmhouse such as might have been built in England at any time from the day of Shakespeare to the end of the Georgian era. One more reason for the strong appeal which English domestic types exert in

America is that they may be easily and correctly developed in materials of a number of different kinds; stone, brick, stucco or wood in different forms or several of these materials in combination may be fittingly used to work out the different English types, and the plan of the house, without ceasing to be definitely English, may vary from that of the square, prim and somewhat box-like type of William and Mary to the irregular and rambling farmhouse which cannot be said to belong exclusively to any one of the periods.

Into this volume Mr. Rosenberg has gathered illustrations from photographs or sketches of quite a number of just the buildings which most interest American architects and builders today. No part of England is richer in material of this character than the southern and south-eastern portions, and the examples which are here presented are from the Cotswolds, Suffolk, Sussex, and Kent, the shire which includes Canterbury. These old villages and small towns have yielded many a photograph or sketch of cottage, farmhouse, minor manor house or a building of some other description which is full of help and inspiration to the American architect and his client. The work also includes a goodly number of working drawings of gables, chimneys, dormers, oriel or casement windows, or else of interior details such as fireplaces, doorways or staircases. Each of the illustrations of buildings is accompanied by a short description giving information as to certain details of the building which would be likely to aid the architect or builder in gathering something of its character. The book would certainly be worth to an architect every penny of its cost in the suggestions which it will afford.

## COLONIAL INTERIORS

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**I**NTERIOR woodwork during the Colonial and early Federal periods was exactly what is demanded for "Colonial" interiors today. The character of workmanship in the colonies insured craftsmanship of excellent quality, and this, together with design carefully studied from the simpler contemporary English work, resulted in woodwork which it would be difficult to improve upon. For this reason close study is being made of such old American interiors as still exist, and measured drawings make possible the reproduction today of much of the finest woodwork of the seventeenth or eighteenth century. These

forms, while they involve not a little subtlety in the details of design, demand merely the use of simple mechanical processes which are not beyond the skill of any reasonably proficient woodworker, sometimes of an ordinary carpenter.



**I**N this valuable work on the early American periods there are given illustrations from new photographs of interiors of the time, many of which are little known. These illustrations are of rooms of different kinds and of widely different types,—the early, somewhat severe type as well as that which was later and more refined and luxurious. Valuable illustrations are supplemented in many instances by invaluable working drawings,—details of wall paneling, mantels, over-mantels and fireplace surrounds; door and window trim; china closets; newels, balusters and other details of stairways, and designs for the

stenciling of floors, together with notes on the colors originally used. It is a volume which in its practical usefulness will be of great value to architects whose work involves much use of early American interior design.

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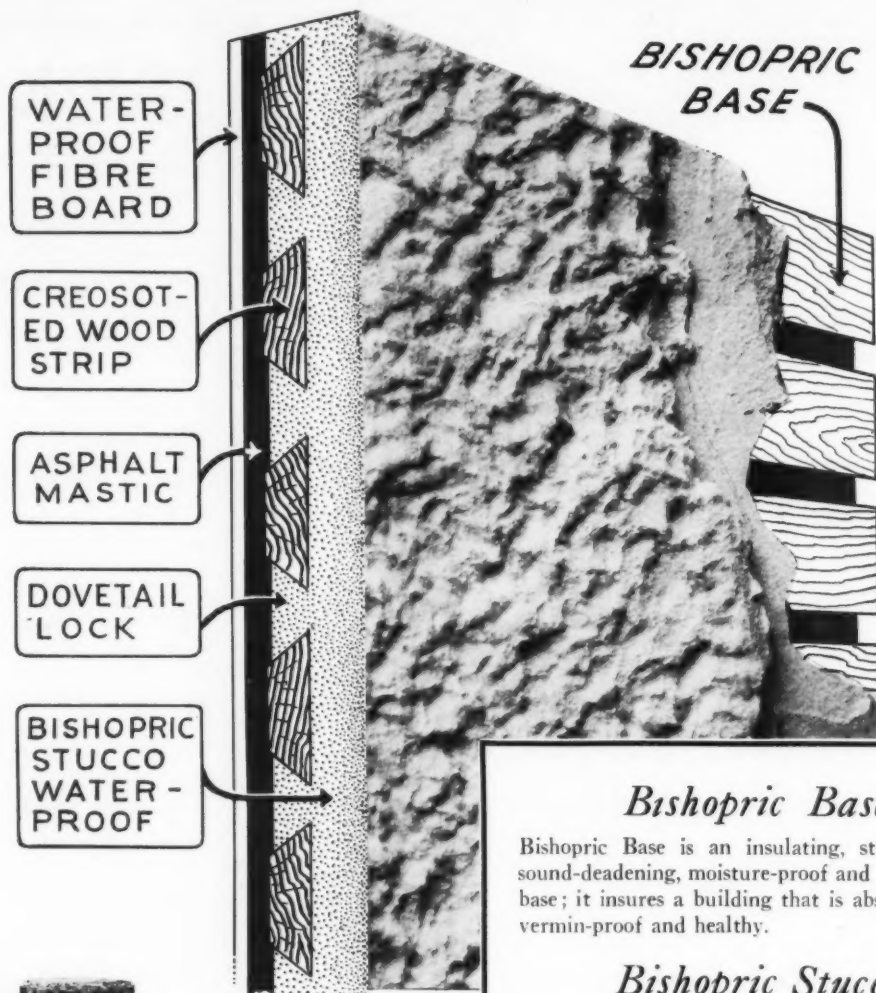
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# THE EDITOR'S FORUM

## GOLF TOURNAMENT

PREPARATIONS are being made for this year's session of the Annual Golf Tournament for Architects of the Southeast which will be begun on May 9, 1924, at the East Lake Country Club, Atlanta. This tournament is open to all architects and architectural draftsmen of the southeastern part of the United States, and no entrance fees are imposed. As in former years a number of prizes or trophies will be offered,—the "Southeastern Architects' Gold Championship Cup," the "Atlanta Architects' Championship Cup," and the "Southeastern Architectural Draftsmen's Cup." The details of arranging the tournament are in the hands of W. J. J. Chase, 140 Peachtree Street, Atlanta, to whom application should be made by those who expect to take part in the tournament.

## RECENT NECROLOGY

PIERRE L. LE BRUN, born 1846, died February 14, 1924, will be remembered not only as the architect of the Metropolitan Tower but also as the founder of the Willard Collection of Architectural Casts at the Metropolitan Museum, the donor of the Pierre L. Le Brun Library at the same institution and of a similar gift to Montclair, and perhaps chiefly as the founder of the Le Brun Scholarship. His generosity and the wisdom which directed it entitle his name to grateful remembrance.

In the recent death of Clarence Luce there was lost an architect whose best known work was almost entirely in connection with expositions. He designed the Massachusetts Building at the Centennial, the Court of Honor at the Paris Exposition, and the New York Buildings at the St. Louis, Jamestown and Portland Expositions. In addition to designing structures such as these, he was the architect of many buildings of different kinds in New York and Washington and in various other cities.

Lewis Colt Albro, whose death occurred recently, was born of American parents in Paris in 1876. His youth was spent in Pittsfield, Massachusetts, and in 1893 he entered the office of McKim, Mead & White where during 13 years he was entrusted with much important work. From 1906 to 1913 as a partner in the firm of Albro & Lindeberg, his work, which was chiefly of a domestic nature, was marked by a high and unvarying standard of excellence, and during the following 11 years of his independent practice it was distinguished by originality, versatility and by that keen appreciation of color, mass and design which won for him the honor of being included among the American architects notably successful in the field of domestic and civic architecture.

## 1924 ARTS TOUR

ONCE more announcement is made of the European tour which is conducted each year under the auspices of the Institute of International Education. The 1924 tour will be directed by Prof. Albert C. Phelps of the College of Architecture at Cornell University, under whose direction last year's tour was so successfully made. Other members of the faculty will be Edith R. Abbot of the Metropolitan Museum of Art, as lecturer on the history and appreciation of painting; Professor Edward Lawson, Fellow in Landscape Architecture at the American Academy in Rome, as leader of the travel course on landscape and garden design, and John Clark Tidden of Rice Institute as instructor in painting and lecturer on the fine arts.

Each year demonstrates more clearly the great value of directed travel for the student of architecture and the other arts. Details of the 1924 tour may be had from Irwin Smith, Director of the Institute, 405 Times Building, New York.

## SPRING EXHIBITIONS

THE first exhibition under the auspices of the Chicago Architectural Exhibition League will be opened May 1 at the Art Institute and will extend over the month. The Architectural Exhibition has heretofore been given by a committee appointed jointly by the Chicago Architectural Club, the Illinois Chapter of the American Institute of Architects, and the Illinois Society of Architects.

The Chicago Architectural Exhibition League, a corporation not for profit, has been newly incorporated for the purpose of taking over the functions of this committee with the idea that a permanent body could plan its program for a term of years, and with the accumulated experience and good will could produce exhibitions that would reflect greater credit on the profession. The exhibition will be illustrative of architecture and the allied arts, and may include drawings and models of proposed or executed work, academic drawings, examples of rendering sketches, sculpture and the allied arts and crafts, photographs and other features, specially arranged with the Exhibition Committee.

The joint exhibition given by the Boston Society of Architects and the Boston Architectural Club will be held at the Rogers Building, 491 Boylston Street, during the month of April and will be opened the afternoon of Monday, March 31.

From April 7 to 28 inclusive the St. Paul Chapter of the American Institute of Architects will hold an exhibition in the interests of architecture and the allied arts at the St. Paul Public Library. The chairman of the exhibition is T. G. Holyoke, 649 Endicott Building, St. Paul, to whom inquiries are addressed.



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FROM PENCIL SKETCH BY H. F. KELLOGG

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## Architecture of Liturgical Churches

By RALPH ADAMS CRAM

ALL the Christian architecture we have inherited from the past, from the time of the Emperor Constantine to that of the Medici, the Bourbons and the Stuarts, was the varied expression of Catholicism, whether of the Patriarchate of the West or those of the East. Plan, form, organism, all grew inevitably from the play of racial stocks and increasing, indelible tradition, on the liturgical system that had been developed by the Church to express the faith of which she was the custodian and to give it the most powerful and effective appeal to the peoples in her charge.

There is no authentic record of non-liturgical Christian public worship in apostolic or post-apostolic times. The moment the Edict of Toleration was promulgated (A.D. 313) the Church appeared before the world with a full liturgical system, rich, elaborate and significant, and this remained in universal use, though with local additions and sequent modifications, for thirteen hundred years. Since the sixteenth century it has been continued by all the Eastern Orthodox Churches, the Roman Catholic Church, and, in modified and curtailed forms, by the Anglican Church and the Lutherans. Non-liturgical public worship was unknown to Christendom until the time of John Calvin (d. 1564), from whom sprang the various Protestant denominations.

Contrary to common belief, the primitive worship of Christianity was not the simplest in form; instead, it was of extraordinary elaboration and magnificence. The nearest approach we have today to this earliest type of Christian worship is in the solemn, tremendous and highly elaborated services of the Greek and Russian Orthodox Churches, and the Visigothic or Mozarabic rite still celebrated in Spain, in chapels of the cathedrals of Toledo and Salamanca. The Roman Mass was an attempt (and a successful one) to devise a service that should be shorter, simpler and more popular than the primitive rites with their intricacy, their magnificence and their interminable length. The reformers of the sixteenth century did not return to the "simplicity" of earlier days, but rather to the Temple worship of the Jews, but without the solemn ritual and fine,

austere symbolism and ceremonial which it possessed.

All the architecture, then, of Christianity, which casts such imperishable glory over fifteen hundred years of history, whether it be basilican, Byzantine, Lombard, Romanesque, Norman, Gothic or Renaissance, and the allied arts, as well, from painting and sculpture to stained glass and needlework, are the outgrowth, or rather the visible manifestation, of a religion which was essentially liturgical in its methods since it was inextricably bound up with beauty, and the ministry of beauty, in all its forms.

Now, for the first fifteen hundred years Christianity was essentially sacramental, and it so remains today so far as the Roman, Eastern and Anglican Churches are concerned. The seven great sacraments, together with the prophetic function of preaching, largely controlled the development of the organism of church buildings. Of these sacraments the Holy Eucharist or Mass was and is supreme in a very particular way, and its nature, the ceremonies that surround it, and its relation to the whole body of the faithful, practically determined the essential elements in a church plan. The Eucharist is both communion and sacrifice; in its first aspect it is for the constant spiritual strengthening of the people; in its second it is not only a perpetual memorial, but in a real sense an extension in time of the Sacrifice of Calvary and is potent for both the living and the dead, and as well a continuation of the sacrifices of the old law of the Hebrews under the new law of Christianity. Unique in its majesty and power, it demanded equal primacy in position and distinction. Therefore from the beginning a church was an altar, guarded and exalted but (in the West) clearly in sight before all the people, protected in every way, surrounded by all the beauty possible to man, and with accommodations for the priests and other members of the hierarchy, the choristers, acolytes and other orders of ministers. The remainder of the fabric was to shelter the worshipers, the congregations that came together for sermons, the processions and pageants, the subordinate chapels, shrines and altars, the tombs of the pious dead, and finally was for the exaltation by means of architecture and all the arts, through fabrics sometimes of vast



Choir and Sanctuary, St. Anne's Chapel, Arlington Heights, Mass.  
Cram & Ferguson, Architects

size and always of supreme beauty, of the glory of God and the devotion and worship of His people.

In the earliest days after the liberation, two plans struggled for the mastery—the centralized, with the dome as its controlling feature, and the basilican with its nave and aisles. So far as Europe was concerned, the latter scheme was victorious, and when in the eleventh century the fully developed, centralized church such as San Vitale, Ravenna or the Royal Chapel at Aix was cut in two, and one-half affixed to a basilican nave and transepts, so giving the germ of the *chevet*, the standard type of plan was fixed for five hundred years, the type which has indeed lasted until our own day, and has given us, as its organism was fully worked out and its character established by various races, all the great churches of mediæval Christendom.

Simultaneously, two liturgical tendencies were developing: that of the East, which held tenaciously to the elaborate, primitive ritual and held the Mass in such oriental awe that the altar itself was hidden from the people by a solid screen or iconostasis and no part of the Holy Sacrifice was revealed to them; that of the West (the Catholic Church), where simplification was going on, together with constant diversity and the development of local rites,

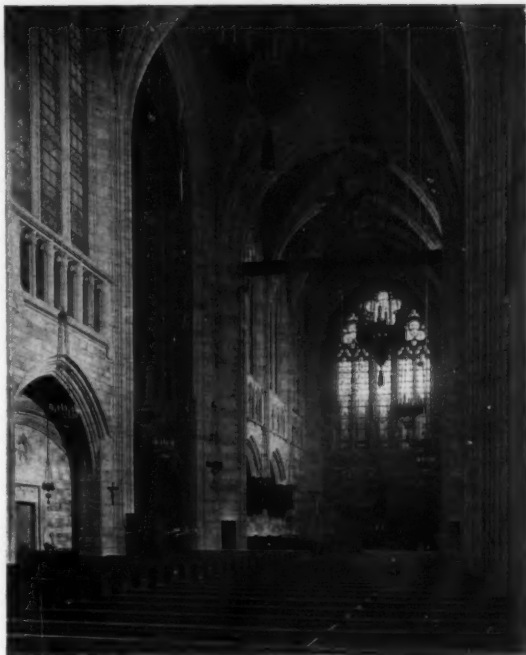
devotions and uses, and above all a certain "democratizing" of worship whereby the altar was brought into the midst of the worshipers and every act of the priests and other ministers made fully visible. Here was a great humanizing process going on at the hands of the Catholic Church, and it resulted in such churches as those of France, Italy and Spain, where the sanctuary is open on all sides, though protected by screens, the choir was reduced to as small a size as possible, and the people crowded up around the altar from all sides. Spain carried this to the farthest limits by pushing the choir for canons and singers back into the nave in order that nothing might come between the people and the object of their devotion. The English cathedral type goes to the other extreme, with the high altar at the far end of an enormously long choir, and solid walls shutting it off from the aisles. This aloofness and forbidding character were not intentional but resulted from the fact that these cathedrals were formerly monastic churches, the enclosed choir being for the sole use of the monks, the people having the nave with their own altars. It is impossible to avoid the conviction that the continental plan is the right one and should be adopted in the case of modern cathedrals.

A Christian church was then, and without contradiction for fifteen hundred years, a place where (a) Mass was said and the people came together for the public worship that centered around this supreme fact of religion; (b) a commodious house where five of the other six sacraments could be administered; (c) an auditorium where many people could be gathered together to listen to the preaching of the gospel; (d) a communal home, blended of art gallery, theater, library, school and public forum; (e) a burial place for saints and heroes and the worthy men of earth; (f) and by no means least, a sort of symbolical dwelling place for God incarnate and His saints and angels, and therefore the most beautiful thing that could be made by the hands of men.

Now the question comes, of course, as to how far the type of church that satisfied these requirements for fifteen hundred years is applicable today to those historic Churches that retain in substance the liturgical worship of the Church of the past. I think the answer is: In every particular. However much the non-liturgical bodies may have diverged from the ancient standards in point of dogma and practice, I fail to see that anything of a similar nature has occurred elsewhere, at least to the extent



of compelling any radical change in the fabric of the church edifice. In the Roman, Eastern and Anglican churches the same governing influences are supreme and with the same order of precedence. Occasionally one meets with the curious belief that mediæval churches were not intended for preaching and so are not entirely practicable today when preaching is so much stressed. The facts are exactly the reverse. Sermons were more prevalent in the past than today, and they were vastly more prolonged. Frequently from ten to twenty thousand people came together to hear a famous evangelist and adjournment was necessary to the public square. Even today the standard length of a sermon in Spain is one hour. It is safe to say that in Spain today (as well as in any mediæval city), as many sermons are preached in a month as are delivered in a year in a Protestant community. The vast naves of the old cathedrals and parish churches were built as they were, with their many columns, lofty roofs, great length and wide floor areas, quite as much because so they were best fitted for the hearing of sermons as because after this fashion they were most beautiful, awe-inspiring and conducive to reverence and spiritual stimulation. A good auditorium should be long, narrow, high and much broken up by columns, arcades, arches, and vault ribs or roof beams. The square form, beloved of



Nave and Choir, St. Vincent Ferrer's, New York  
Fine example of large monastic church, though lacking permanent and adequate furnishings



Altar and Reredos, St. Thomas', New York  
Bertram Grosvenor Goodhue, Architect

Protestantism, is the least successful form one could adopt and most difficult for the architect to design.

The prejudice against columns is, like that against length, without foundation in fact. It is only a theory that people do not like to sit behind them, and I fancy it arose out of the jealousies engendered by the bad old custom of rented pews, now largely relegated into oblivion. A church is not a theater; seeing is not the only way of worshiping, and neither is hearing for that matter. With the growth of a more spiritual sense of religion after the dark days of modernism, these prejudices are gradually being abandoned and will ultimately disappear. On the whole, therefore, I think I can repeat that the general type of church acceptable for the first fifteen hundred years of Christianity may be accepted today as entirely adequate, practically without any changes compelled by modern conditions.

Allied with this consideration is the question of style. This is so large a subject and spreads out so widely that it is impossible to consider it here in detail. Of course we ought not to be obliged to question the matter at all; we ought to be able to build almost instinctively, as men built in the past, but equally of course we are not able to do any such thing. The sequence was cut as with a knife, and for three centuries the natural creative impulse along artistic lines has been moribund and we have had to act with explicit self-consciousness and artifice. Somehow we have to get back to better ways, and lacking a better, it seems to fall to archi-



SANCTUARY OF A MODERN ENGLISH CHURCH  
DORSAL, RIDDELS AND TESTER EMPHASIZE DIGNITY OF ALTAR  
G. F. BODLEY, ARCHITECT

fects to assume this part of leadership, at least so far as the designing of buildings is concerned.

Hitherto there had of course been no such thing as one specific style for churches and another for secular buildings; at least this was true up to about the year 1825—and not only in America but everywhere else. So long as Europe had substantial unity, not only in religion but in its social organism and cultural standards, i. e., to the beginning of the sixteenth century, this was inevitable, for religion was as much a part of life as fighting, love-making and play, so the only variants grew out of racial, climatic and traditional differences. When Europe began to break up a new style in art had come into fashion, establishing itself everywhere, and as the new and constantly dividing religions seemed to possess nothing of that peculiar spiritual energy which revitalizes an art or develops new form; as it inflexibly set itself against beauty in all its aspects, and as it took over to its own uses the old churches instead of building new ones, nothing happened in architecture except—when the rare occasion demanded, as the great fire of London—submission to this new fashion of building, whether it was appropriate or not. Puritanism in America did produce an interesting variant of the latest English Renaissance, more nearly expressing current theology and ethics than anything that had happened before, but it was an exceedingly narrow and crabbed style and beautiful rather in contrast with what immediately

followed than with that which had gone before.

When the romantic, neo-mediæval and Catholic movements began in Europe early in the last century it became immediately necessary to invent or return to a style more consonant with the new principles and ideals invoked, and of course the Gothic revival ensued. This went forward most successfully in England for 75 years, achieving a high point of excellence, and the same thing was true in other European countries and in America with less happy results. Richardson threw his big monkey wrench into the rather makeshift machinery of the Gothic revival in this country, and for 20 years the anomalous but intriguing style he had made his own held the field, finally dying out in the ineptitudes of his breathless camp followers, when Gothic resumed its sway and has continued until today, extending its domain over every known kind of Protestant denomination (except Christian Scientists, Mormons and Quakers) and only during the last 20 years finding its sovereignty disputed by newly recovered styles. These are: the original Colonial, a modified Lombard with occasional Byzantine infusions, and the late Spanish Colonial type more or less suggestive of Mexico and the California missions. The result of course is fairly chaotic and far from convincing. In any good-sized city you may find, almost side by side: a Roman Catholic church in "Plasterer's" Renaissance; an Anglican church from the Ile de France; a synagogue after the Arabic



The Building of Churches Often Covered Centuries  
Note the round arches at left and the pointed at right



mode (?); the Third Presbyterian in the style of the Auvergne; "Dr. Whipple's Church" (Unitarian) in English Perpendicular; the Main St. Tabernacle (Calvin Baptist) in a very delicate form of twelfth century Italian Lombard, and a Christian Science temple in pure Carnegie.

Well, what are we going to do about it? There is something wrong somewhere, but, assuming a virtue if we have it not, we still proclaim this a free country, and the right of private judgment extends to art (particularly architecture) as well as to Biblical exegesis and the interpretation of creeds. Fortunately, I have to deal only with the architectural expression of liturgical churches, and to me the answer here is limpid in its simplicity. "Go on from where you left off." By which I mean something like this. If the church is of the Anglican rite, pick up English Gothic where it was cut off at the time of Henry VIII, but do not stop there. The whole field of Gothic is available; find beautiful things where you can, and try to mould these varied beauties into a consistent whole, but do not stop there. The Catholic Church (of which Anglicanism claims to be a part) is a living organism, and three centuries have passed since the extinction of King Henry. Do try to get something that gives the note of life and of contemporaneity. It can be done; witness Gilbert Scott's Liverpool Cathedral, to come no closer home. Other styles seem to me artificial, unless perhaps climate and local tradition justify a Spanish or Mexican cast in the Southwest. Even this does not seem very logical when you think of the genius of Anglicanism, but logic is sometimes a synonym for death, and I fancy that if I had the chance I should do a Spanish Renaissance Episcopal church in New Mexico or southern California, forgetting the Anglicanism and remembering only the Catholic norm.

The Roman Catholic problem is only a little less simple. Of course all Christian architecture, like all Christian art, is the product of Catholicism, so the field of precedent is somewhat extended. Also the racial strains that go to make up the Roman Catholic Church in America today, are varied in

the extreme, and for these two reasons the obvious deduction is not so clear as in the case of Anglicanism which, but for its brief flirtation with Romanesque, has held steadily true to English Gothic, or as it should be in the case of the denominations that derive directly from Puritanism. When the Catholic artistic recovery began about ten years ago it was led by able architects along various lines, Gothic, Lombard, Byzantine, with notable results, but it was all *architects' work*, and good as it is it certainly lacks that quality of unity and conviction one would expect in this place. At present it is sometimes

impossible to tell the Fourth Presbyterian, the Episcopal St. Alban's, the Unitarian All Souls' and the Roman Catholic cathedral, the one from the other, so far as their externals are concerned. Perhaps it is not necessary, but one somehow feels that a Catholic church ought so to express itself to the passer-by. One is inclined to urge a consistent return to the universal Gothic of Catholicism, at least as a point of departure, as the Anglican Church has done, for after all, Byzantine and Lombard are old stages passed on the way, while the Renaissance of Italy is hardly consonant, in its associations and implications, with the Catholic Church of America today, and certainly the modern French adaptation of this style is still



St. Paul's Cathedral, Detroit  
Cram, Goodhue & Ferguson, Architects

less significant. The great trouble is that the Roman Catholic Church has too wide a field to draw on, too many great styles to its credit. Perhaps it is too soon to look for clear leading and consistency; the dark ages of artistic barbarism are too close at hand. Sooner or later, after various interesting experiments, there may come a settling down to a sound basis, and a new thing may grow out of Byzantine, Gothic or Lombard, which will yet be the old in new guise. After all, this is the principal point to be remembered: the liturgical church represents a living organism with a continuity that reaches back to the Feast of Pentecost; therefore the style must express this fact, but it must also adapt itself to modern conditions, for this is the genius of the Church; immutability in essentials, adaptability in non-essentials, and unchanging in a changing world.

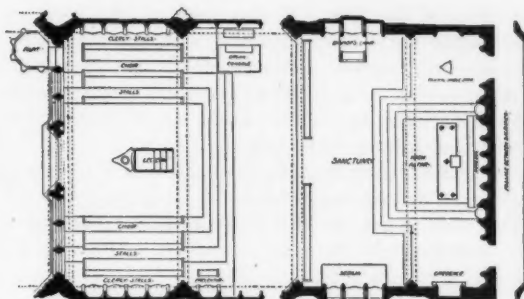
This consideration has a bearing not only on style



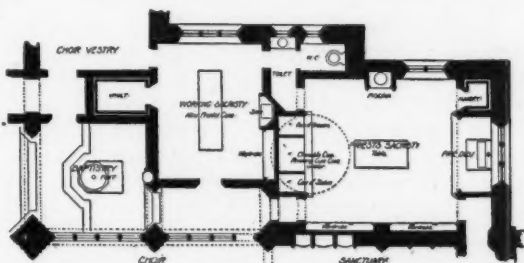
and on the general organism of the church, preventing the use of pagan forms (old or new) and the adoption of strange theatrical plans or dispositions, but as well on the question of modern inventions in construction and the use of substitute materials. The liturgical church, because of the peculiar nature of its doctrines and its worship, cannot consistently employ cheap substitutes for anything, or imitations or deceptions in any form, for this takes on the character of sacrilege. This rules out steel or concrete construction overlaid with imitation masonry, while a new style cannot evolve from these admirable structural expedients because so would wholly be lost the sense of tradition, history and continuous life. In this category of church building honesty is the only course that can be followed. I suppose it is hardly necessary to say that here also the fad that seems to be spreading elsewhere, of combining in one inharmonious whole a church and a hotel or office building or other revenue-producing investment, is forever and irrevocably barred.

In any church there must be a real unity and co-operation among the several arts, but the opportunity for this is greater here than among the non-liturgical denominations. Not only may every art be used to the limit, but each must be transfigured by its function, for here everything is symbolical, down even to the smallest element of ornament in carving or color. Several of the arts have lagged far behind architecture in the great process of recovery, particularly painting and sculpture, and as architecture, when called into the service of religion, cannot do without these arts, it is desirable that in some way they should catch up. Unfortunately, the art schools are almost as oblivious of religious art as were the architectural schools 20 years ago, so the opportunities for training are reduced to a minimum. Well, in spite of the high disfavor of the academic institutions, architects did manage to become great church builders, so there is no reason why painters and sculptors should not win equal success under similar conditions.

Now it may be admitted at once that certain of the principles here laid down will not find willing support from some clergy and vestries and building committees. During the past century the customs and theories of Protestantism have crept into the liturgical churches, particularly the Episcopalians, with results that were fast bringing them into line



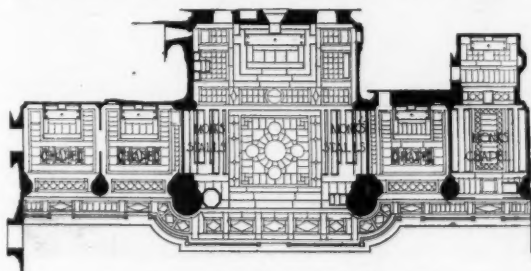
Plan of Typical Choir and Sanctuary



Arrangement of Priests' Sacristy, Baptistry, and Working Sacristy

with Evangelical structures. The prejudice against columns, the intrusion of side and transept galleries, the reduction of the sanctuary into a mere platform or niche, the elimination of subordinate chapels, altars and shrines, even the fear of a long nave and a high roof—all these infelicitous things held for a while, and are still to be encountered here and there, but they must be met with firmness and their irrationality demonstrated, for one and all they strike at the root of that quality which distinguishes the liturgical from the non-liturgical churches.

I shall not try to lay down a series of simple rules to guide a young architect who has never been to a Catholic Mass and whose knowledge of the Episcopal Church extends perhaps to assisting at "High Matins" once in a while. It cannot be done. It would be easy enough to epitomize "The Parson's Handbook" (that excellent work by Dr. Dearmer) and tell all about the arrangements of a chancel and sanctuary; what should be the dimensions of an altar, the disposition of its tabernacle, gradine, foot pace and steps; where the sedilia ought to go and the credence and the piscina; the place for a sanctuary lamp, the function of a reredos, the nature and purpose of parclose screens, and all that sort of thing, but what would be the use if the names meant nothing and the youthful practitioner were substantially ignorant of the informing dogma, the reason for and nature of the established devotions, the history and tradition that go back for more than 15 centuries? The way to learn how to build a liturgical church, Roman, Anglican or Orthodox, is to become steeped in the religion itself both in



Suggestion for Choir and Chapels

theory and practice, and then become familiar with the long sequence of church building back to the Edict of Toleration. There is no teaching in architectural schools that gives assistance along these lines, fruitful (and profitable) as they are; one must pick it up for oneself.

It is a field worth investigating. Apart from certain spiritual benefits, the demonstration of which forms no part of the function of this paper, there are other considerations of moment. Much of the work architects are called upon to do is ephemeral; the thing built today may be scrapped in 20 years. I myself have seen three buildings (the first by McKim, Mead & White) constructed in succession on one street corner in New York. Liturgical churches are apt to be reasonably permanent; they do not, like the beautiful Presbyterian church in Madison Square, rise only to fall and give place to a life insurance building. With them one builds for centuries. Again, by their very nature they must have dignity, majesty, beauty if it is only the beauty of mass and composition and texture of materials.

They are not likely to be involved in a dominating maze of "institutional" adjuncts or compromised by commercial adhesions. Finally, they must have historic suggestiveness as well as propriety, and this means the chance to go back and study great styles, finding out why they were great and where their beauty inheres, after which—to go on and see how "these dead bones may live" through the infusion of something of the vital present.

I do not suppose there is a greater opportunity in architecture than just this of serving the liturgical churches, particularly now that the Roman Catholic Church is seeing the error of its old ways ("old" in the sense of the last two centuries) and is now coming forward to demand the best architecture and the best arts that are obtainable. There is no doubt about it; in spite of Fundamentalists and Modernists, religion is coming back, and the wise man will prepare himself to serve this reëntrant force, not only for the compensation there is in it—both in point of fame and pay—but because it is a joy in itself and a dynamic contribution to well-being.



Organ in Choir, Seville Cathedral  
Renaissance ornament in Gothic church



## Institutional Churches

By JOSEPH HUDNUT

*Professor of Architecture, University of Virginia*

**B**Y the "institutional church" I understand that type of church, existing in almost every denomination, which is primarily devoted to some kind of social usefulness; a church which, conscious of its obligations to society no less than to the individual, does not confine its activities to public worship and the administration of the sacraments, but actively fosters every good tendency in human thought and feeling.

I think of the institutional church as one which, because of its concentration on a more exigent task, is indifferent both to dogma and to ritual. It is not, in great measure at least, concerned with the Hellenistic and scholastic subtleties with which the teachings of Jesus are overlaid, the doctrines which crystallized at Nicea, Heidelberg, or Westminster; nor is it absorbed in the artistry of its service, in forms and methods of procedure, in making more dramatic a certain kind of religious experience. Nor is it intent upon the interpretation

or advancement of some hierarchic authority. It is devoted rather to a practical effort to translate the profound and beautiful morality of Jesus into such luminous and compelling terms as to make it an active agent in the social life of our own time.

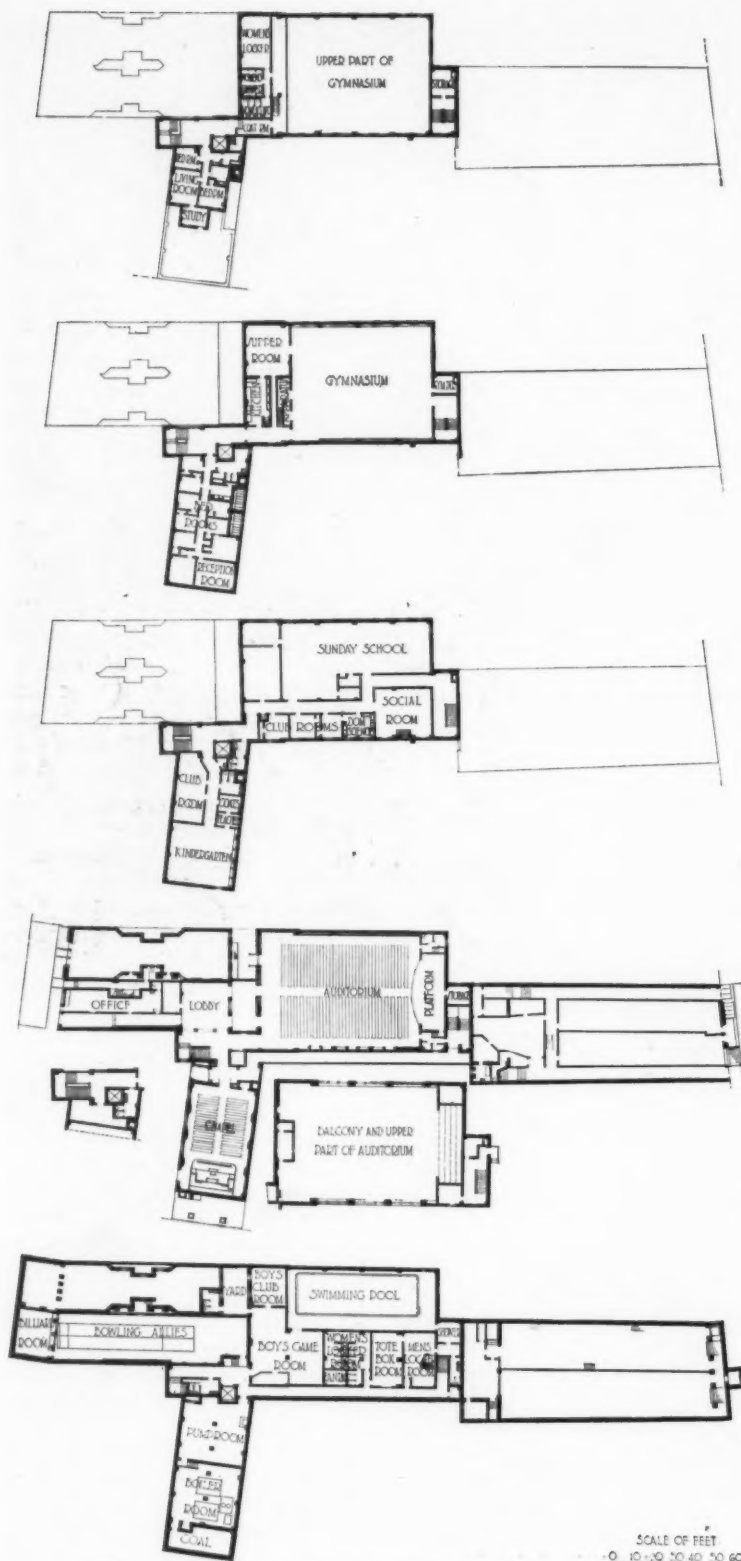
The principle which underlies the activities of this type of church is the conception of life as a unity. Life cannot be divided, except in the imagination, into "religious," "social," and "educational" experiences, nor can any of these experiences be cut up into emotional, intellectual, and physical elements independent of each other. True religion is not a code of ideas and philosophic principles; nor is it an emotional exaltation or æsthetic pleasure felt in prayer or song or ritual. Religion is a way of living, in the manner in which we recognize God in our lives. It is something which touches us at every moment of consciousness, in every human relationship. The institutional church recognizes this immanent and universal pervasion of religion through



Doorway to Parish Building, Congregational Church, Wellesley, Mass.

Carrere & Hastings, Shreve & Lamb, Architects





Floor Plans, Church of All Nations, The Bowery, New York  
Julius Gregory, Architect

life. Like the mediæval church, therefore, it is concerned with every activity of life; with social intercourse, teaching, entertainment, recreation, organized charity, music, art, and the drama. Unlike the mediæval church, it does not attempt to subordinate these to the requirements of its own existence; its purpose is rather to inform all of life's activities with the quickening spirit of Christian truth, as the thinking men of our own day see that truth. The church is to be the great educator, not of man only, but of man's institutions. The Christian spirit is to be felt deeply, though unconsciously, in every human activity, becoming less a code applied to life, less a form or ceremony outside of life, and more a habit of life.

These ideas, which are those of the spiritual leaders of the church rather than of the masses of church members, have led to a new conception of what is required in a church building. The churches of the past century, which comprised little else than a great meeting hall embellished with the sentimental vagaries of the "Gothic revival," are wholly inadequate for this new usefulness. Even less adequate are the churches which are designed, after the models of mediæval churches, primarily as a setting for a liturgy; churches which are, in fact, only an extension of a liturgy into stone and wood, a concrete expression of its symbolism. The modern leaders are likely to be a little impatient with an architecture of symbolism, even a beautiful and ancient symbolism, if it is found to be costly, ineffective and troublesome. Especially are they impatient with an architectural symbolism which no longer possesses any meaning which can be understood by men of our own day or which, being understood, has no longer power to kindle the soul or even to touch the imagination.

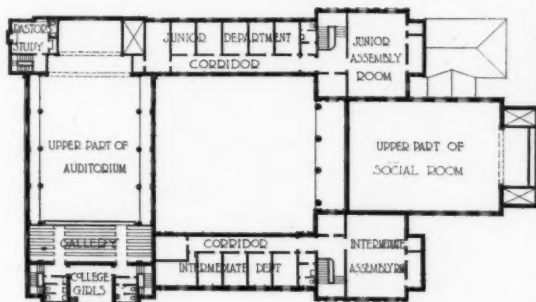


What is wanted for the institutional church is a building that is more than a house for preaching and for worship; a building that may be dedicated to every good work that can enhance the sum of human happiness. It is to be associated in some way with every right exercise of man's social, intellectual, and physical powers. Schoolrooms, recreation halls, clubrooms, and entertainment rooms are as relevant as is the large assembly room for those who participate in religious rites enjoyed in common; our worship of God is to be just as manifest in the one as in the other, and just as acceptable to Him.

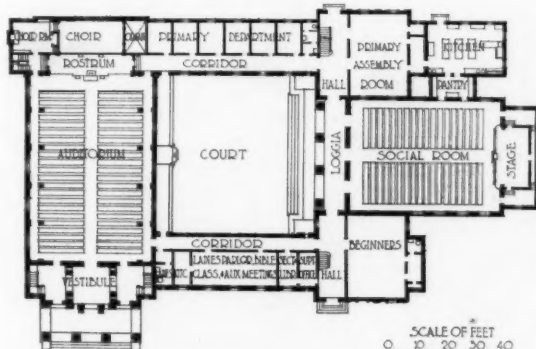
No longer therefore is the church building to be only a great monumental hall; no longer only a mighty symbol; it is to be a grouping of educational, social, and recreational facilities; that is to say, of religious facilities. It is to be a social center, a composition of a hundred rooms, various in size,



Main Elevation



Upper Floor



Rivermont Avenue Presbyterian Church  
Lynchburg, Va.

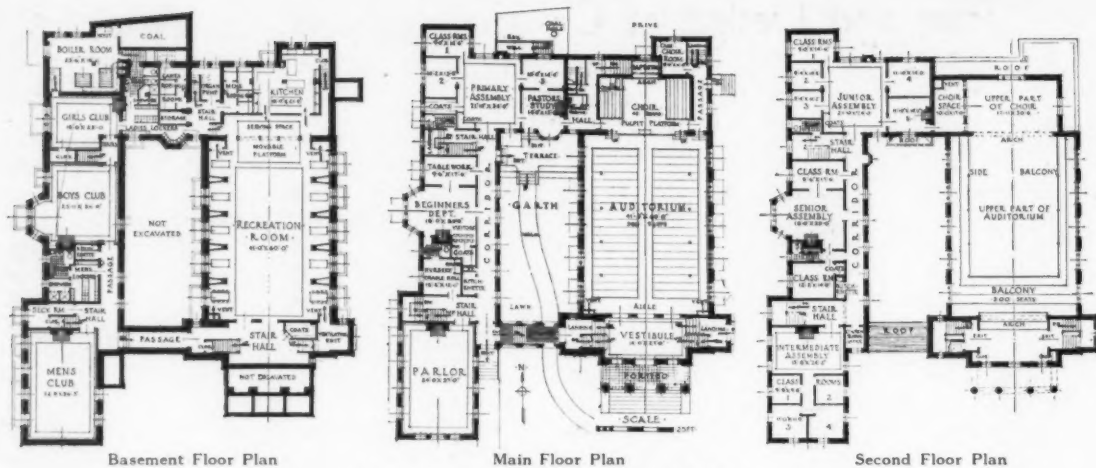
Joseph Hudnut and Craighill & Cardwell, Architects



Side View of Portico and Spire  
Congregational Church, Wellesley, Mass.

arrangement and design, as are the social energies of man, but fused together by a common spirit and a common dedication. The point of view of the men who are directing this vast integration is a practical and immediate one. They want a useful building, organized like any other useful building of our own day, in a straightforward and simple way. They want the arrangement of rooms, the circulation, the construction and the decoration to be governed by the requirements of the particular usefulness which they have in mind. Christianity is a practical doctrine closely related to life, and it demands in architecture neither a traditional posture nor a romantic expression. A church building is a tool to be used in a greater and less visible construction; a weapon to be kept bright and keen for service in a persistent battle against the terrible evils that exist in human society.

Perhaps if we could place ourselves outside of our own time and view it from afar we should see in these somewhat anarchic buildings of the institutional church the beginnings of that great adapta-



Basement Floor Plan

Main Floor Plan

Second Floor Plan

## Lafayette Avenue Baptist Church, Buffalo

Frank A. Spangenberg, Architect; Earl Martin, Associated

tion. Perhaps we should see here the materials of that great rhythm in which the idealism of our day will some time define itself, the first intimation in architecture of that synthesis between science and emotion which is to characterize the religion of the future. The joyous and practical architecture which will express this synthesis will originate from some new demands of usefulness. It will be organized upon a modern principle and designed with a modern

respect for tradition and enthusiasm for progress. We cannot of course say what force will reduce its useful and practical structure to significant harmonies of line and form and space, but that force will not be a conscious or archaeological force. It will be the same spontaneous and implacable force that gave grandeur and sublimity to the useful structure of Amiens, for architectural forms grow out of the requirements which they must meet.



Auditorium, Looking Toward Narthex, Congregational Church, Wellesley, Mass.

Carrere &amp; Hastings, Shreve &amp; Lamb, Architects

# ✓ Plan and Design of Christian Science Churches

By WILLIAM EDGAR MORAN.

*of Goodwillie & Moran, Architects*

IN considering the design and planning of Christian Science churches, it is necessary, primarily, to understand something of the history of this religious body, its differences from other Churches, and the fundamentally distinctive manner in which its organization functions.

Historically, it must be noted that the principles of Christian Science were discovered in the year 1866 through the inspiration of Mary Baker Eddy. The original church of this denomination was not chartered until August 23, 1879. The earliest church in use was that built at Oconto, Wisconsin, in 1886, a small frame structure; while on September 29, 1892, when reorganizing the Church, Mrs. Eddy gave the plot in Boston on which the present Mother Church stands. On this plot in 1894 a building was erected for the individual purpose of church services, and in eight years the church had so grown as to need greatly augmented space, which led to the laying of the corner stone of the extension in 1904.

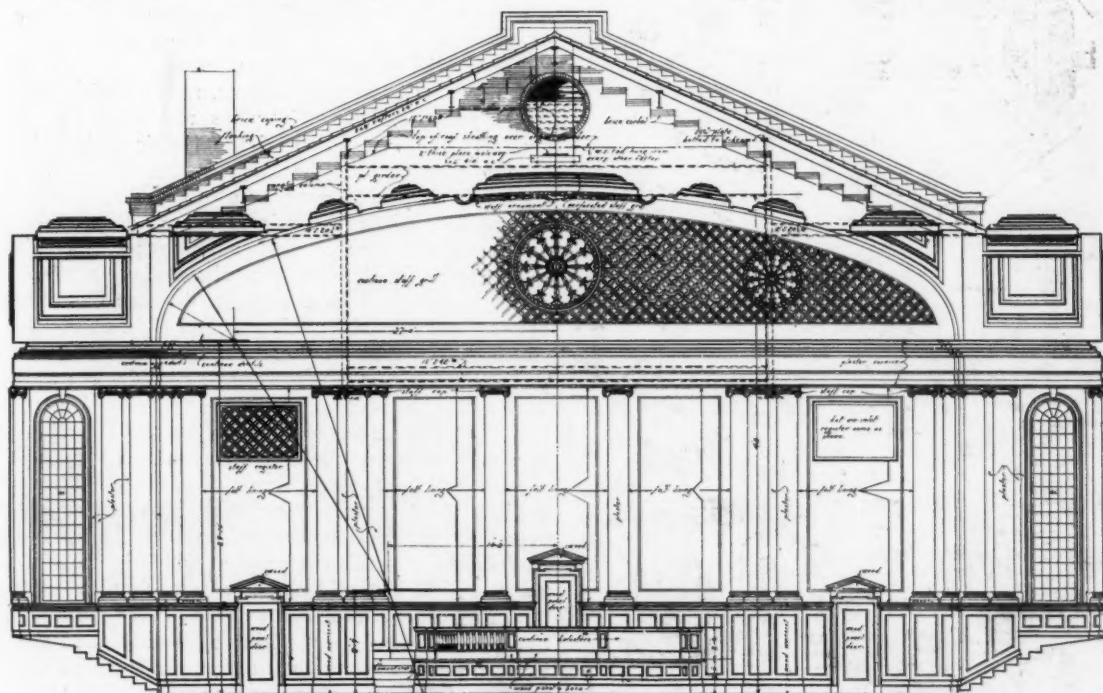
From this beginning in the one small church of 1879, the erection of Christian Science churches has continued and extended, not only all over this country but also throughout the greater part of the civilized world, until today the number exceeds 2,000 churches, a growth unparalleled in religious history.

Although the Christian Scientists, as has been

noted, trace back their actual religious organization only to 1879, their belief, inasmuch as it differs from that of other Protestant bodies, is a return to the teachings of primitive Christianity, with an entire absence of the formalism which, through the course of the 1600 years since Constantine made Christianity the State religion, has been added to and become a great part of the orthodox ritual, both Catholic and Protestant.

In their organization, each of the branch churches is a pure democracy. The church organization comprises a board of trustees or directors elected for three years, so that a majority remain in office from year to year; two readers, a clerk, and a treasurer. The readers are also elected tri-ennially, and, by a wise provision, are precluded from more than one term of service. By this means the opportunity for service to the church is widened. There are no professional pastors or priests, all the officers being elected for stated terms by secret ballot in annual meetings. There are various committees to which the actual work of the church is delegated:—ushers, house, publication, etc., all selected annually and usually non-succeeding.

Another great divergence lies in the complete lack of all forms of so-called "social service," which has grown to such an extent in the orthodox

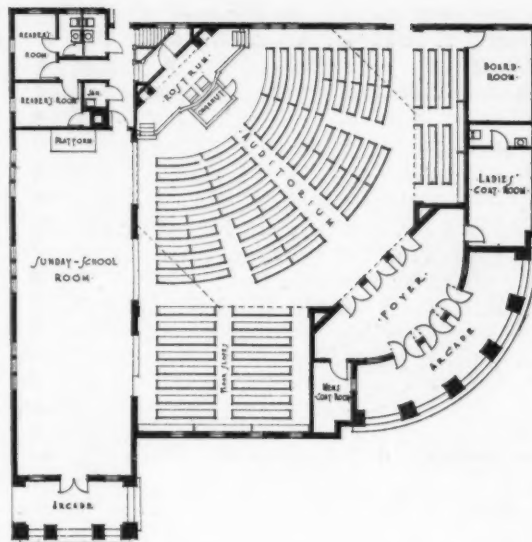


Transverse Section Through Auditorium, Looking Toward Rostrum  
First Church of Christ, Scientist, Los Angeles  
Elmer Grey, Architect

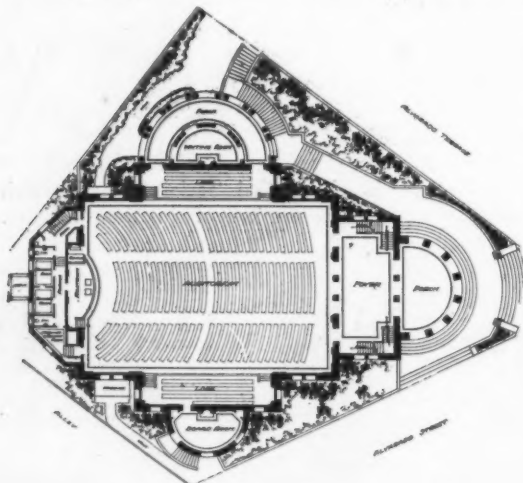


churches as to be of importance almost equal to the religious service, so that it has become necessary to make a sharp division between religious and secular work. The Christian Science Church work, in this sense, lies rather along outside welfare lines, as instanced in the activities attending the Japanese and Halifax disasters and the World War; thus the work does not require special equipment, thereby obviating the necessity of providing for guilds, cadet corps, parish house activities, and other forms of purely secular service. There is another feature of the Christian Science services which is not commonly met with elsewhere; that is, the practice of "visiting" or meeting which goes on before and after the services; but the greatest distinction to be noted is the custom of giving public testimony at the Wednesday evening services, and, as has been said, the entire lack of ritual and form in the conducting of the service itself.

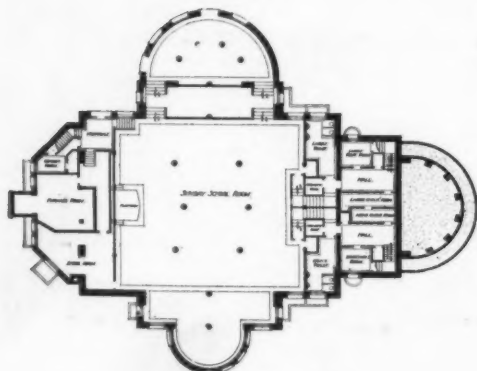
To properly plan a Christian Science church, therefore, a comprehensive knowledge of all these distinctions must be borne well in mind, even before the exigencies of site and cost are considered. As



Excellent Example of Semi-circular Plan  
Note ample areas of foyer and Sunday School room



First Floor Plan



Basement Floor Plan

First Church of Christ, Scientist, Los Angeles

the chief feature of the service is the reading of the Bible and Mrs. Eddy's "Science and Health with Key to the Scriptures" from the desk by the two readers, the building must be planned to make the platform the focal point of the plan design. This does away with all possibility of the use of what has been termed the traditional or elongated plan, which is so appropriate in churches where the service is mainly read by priest and the worshiper and where the sermon is only one part of the service. This difference in scheme of worship does away with any need for chancels, transepts, naves, choirs, etc., which make such beautiful plans, and which add so much to the fascination of the Gothic cathedrals. The requirements of the Christian Science services lead rather to the square plan of auditorium, similar to one type of denominational church plan, which rarely makes extreme length a feature; so that, in consequence, in the first analysis, a plan in which all the seats would be at an equal distance from the reading desk, thereby attaining equal sight and hearing for all, would be ideal from all points of view.

At this point, it is necessary to consider the feature spoken of before, that of the testimonial meetings. At these meetings anyone in the congregation may, as he or she desires, arise and speak on subjects relative to Christian Science, and this brings out the absolute necessity for the greatest degree of acoustical development to make a serviceable church, and it is this requirement which in the final analysis gives as the ideal plan a semi-circular space with the readers in the center, approaching the semi-circle, along the lines used in "academies" and the like. As a general precept, one might say that the church plan of the auditorium or audience hall type, as suggested in certain plans shown here, should be



the basis of all planning for Christian Science places of worship. This is, to a degree, true.

Granted the auditorium scheme, it follows that there should be an entire absence of supports which would break the vision and interfere with hearing of the reading, and this has led through several ramifications to the use of the sloping floor plan, in which the entire body of the church is comprised on one floor, sloping toward the readers' desk, with ramps and stepped aisles, and without the use of galleries. This plan I believe to be an individual feature of Christian Science churches. It has several claims for attention: First, that the entire congregation is on one floor. Second, that the view of the individual is, by means of the sloping floor, well taken care of. Third, it eliminates galleries with their resultant reverberations. It is, however, most difficult to design an interior satisfactorily with this scheme, and the extreme sloping floor is not so comfortable to stand on in the visiting periods referred to previously.

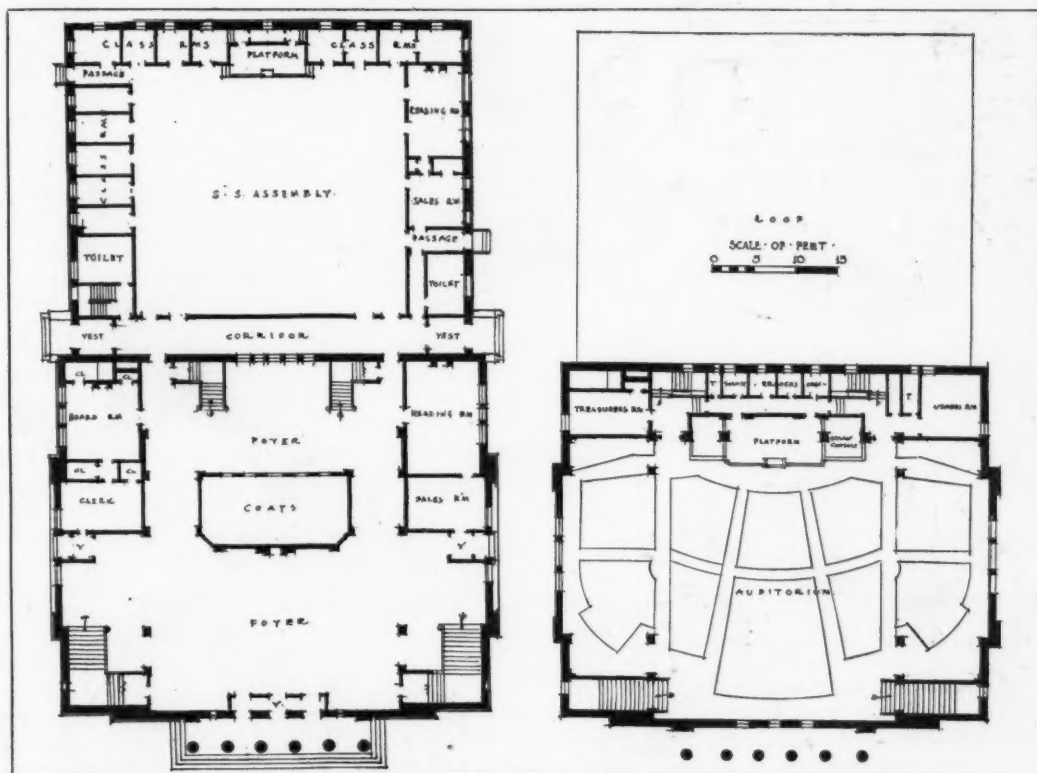
The first church edifice, called the "Mother Church," in Boston, followed in general design and plan the orthodox layout. It had a tall tower, was built of somber granite, and with its stained glass windows could hardly be distinguished, especially in its external aspect, from a building of the Congregational or some other orthodox body. This plan was followed by the Concord church, but in plan-

ning the extension to the Mother Church, an entire change of scheme was made. Instead of Richardsonian precepts being followed, recourse was had to earlier precedents and a building more nearly approaching the early Christian churches of Rome was achieved.

The basilica type plan, as shown in these pages, has proved satisfactory in a greater or less degree, and is perhaps more economical in construction than the true audience hall variations, but it is defective through the necessary use of columns, which are most undesirable. It is, however, possible to provide for it an interesting interior development, and it approaches more nearly to what might be termed the traditional type of the Christian church, for we know that the earliest Christian church was erected under the rule of Septimus Severus, about 180 A.D., and therefore the basilican plan undoubtedly provided the inspiration for early Christian designers.

The plan of the Mother Church extension, generally circular, has been followed in several instances, as shown here. This scheme traces its architectural lineage from the Pantheon in Rome, the Temple of Vesta, and other circular temples. The feature of "visiting" has brought about the incorporation of generously large foyers, as it is here that a great deal of the healing work can be done.

Instead of varying forms of the sacristy, robing room, etc., the requirements back of the platform

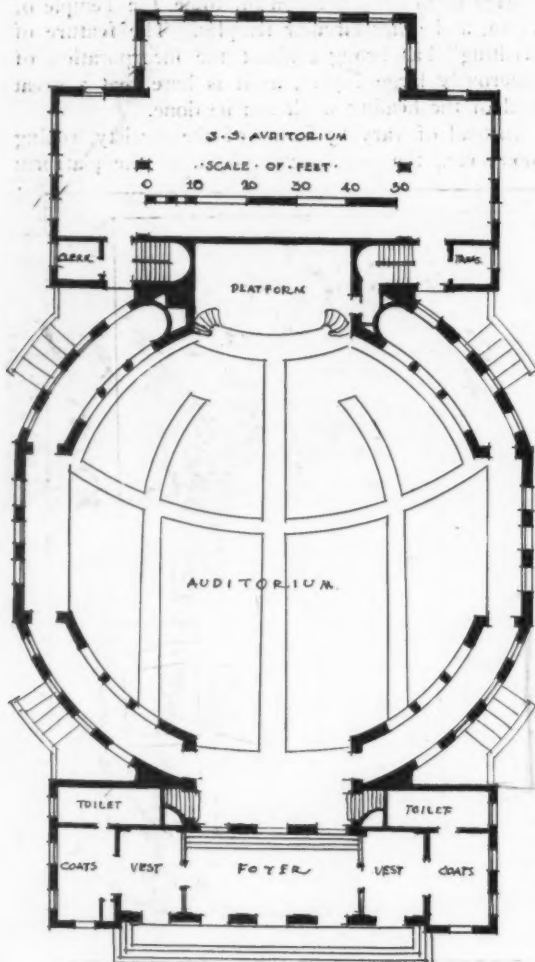


First Floor Plan for Christian Science Church  
Unusual provision for social rooms

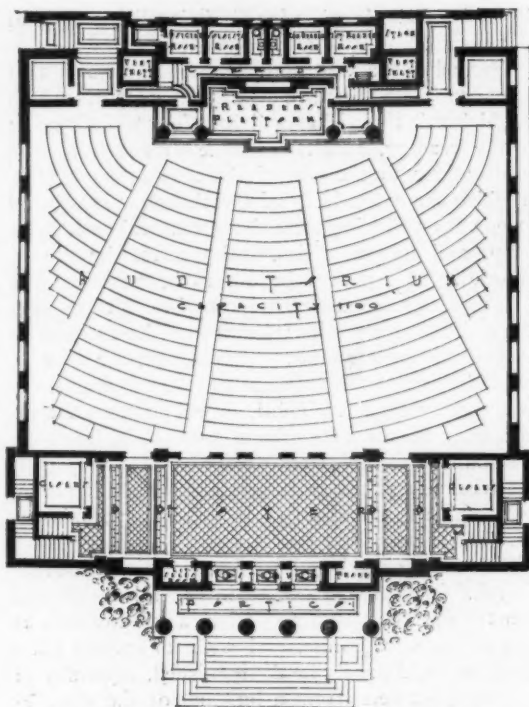
Main Auditorium Placed on Upper Floor  
Note nearness of worshipers to desk

are uniformly simple; small rooms for the two readers must be provided, and one or two rooms for the organist and soloist, with adjoining toilet facilities. The organ is usually arranged in a gallery above the reading platform, and in size this platform is reduced to a minimum, there being no need for greater depth than will accommodate the readers' desk and chairs. In some cases, the soloist (a choir not being customary) also occupies a chair on the platform, and the organ console is concealed below the platform level. As there are no formal services for christenings, weddings or funerals, connection between platform and church need not be direct.

The extra-service requirements of the church are simple; off the foyer must be provided ample coat rooms and toilet space; a board room of such size as will accommodate the requisite number of directors or trustees; an ushers' room where they may hold their preliminary services; and a treasurer's or committee room should be provided; and reading and sales rooms for the dissemination of church literature are sometimes made part of the church



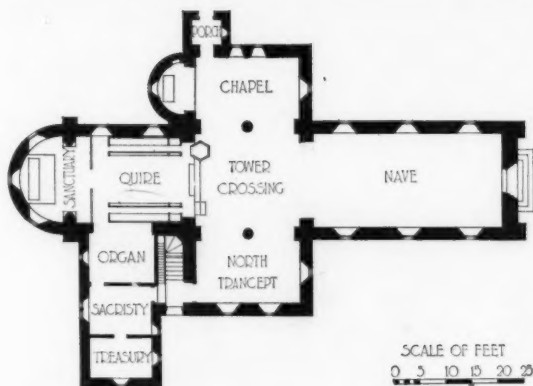
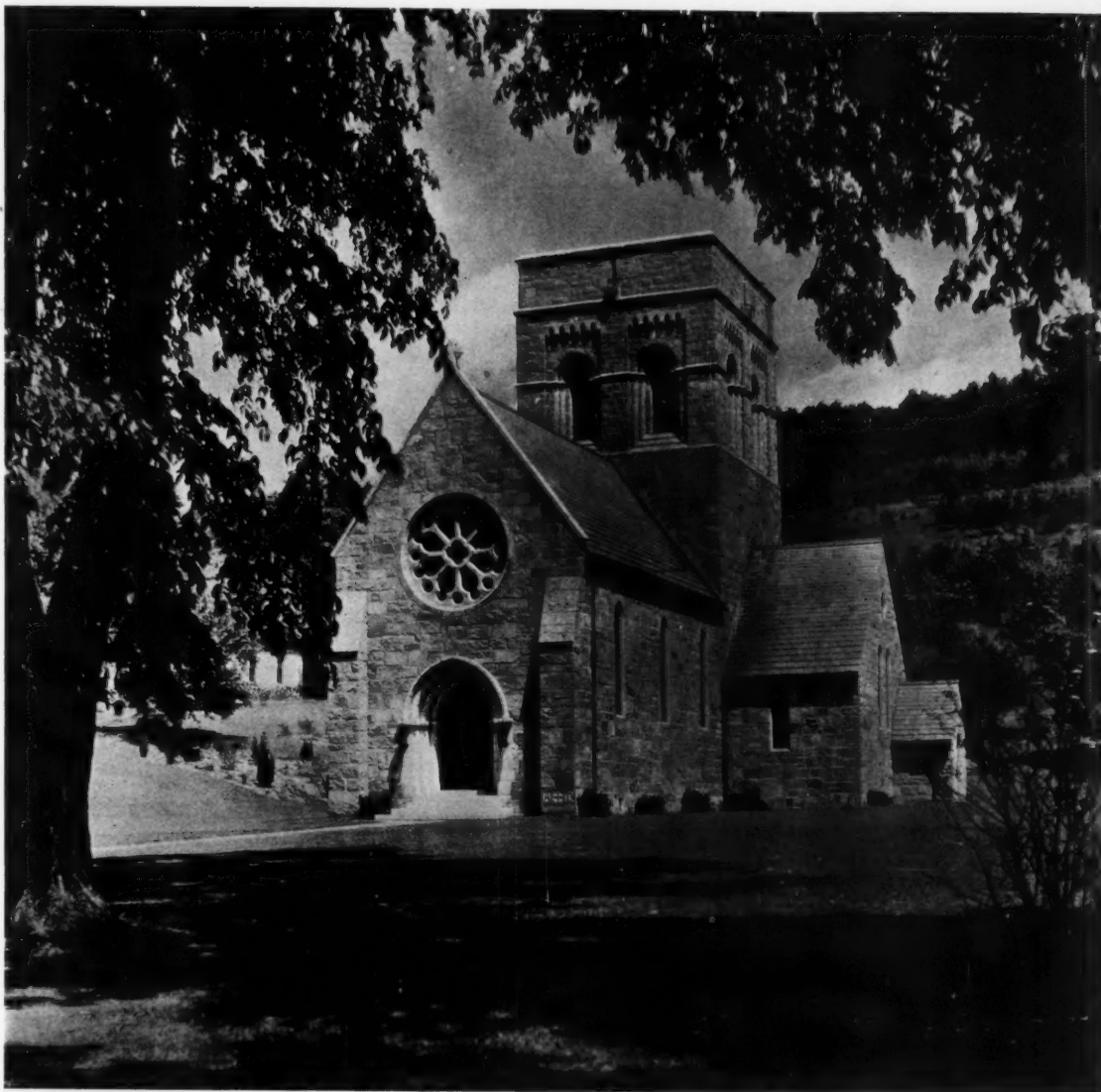
Worshippers Close to Readers' Desk  
Ample spaces for social uses



First Church of Christ, Scientist, Lakewood, O.  
Charles D. Faulkner, Architect

plan. The relation of the Sunday School to the church is of extreme importance, and with the increased development of this work, growing stress is being laid upon proper arrangements being made for this department of the church organization. The double-level arrangement, in which the Sunday School occupies the ground floor, with the church foyer in the front giving access by means of stairs or ramps to the main auditorium, which occupies the so-called second floor, is quite common, and with limited ground space perhaps solves the problem satisfactorily. The ideal arrangement, however, consists of a separate building, connected by corridors to the church proper. In this wing should be provided space for the infant class, certain individual classes and a general auditorium, to be used by arrangement of seating for class instruction, as well as for the services before and after study periods.

As to the question of the type of architecture particularly featured in Christian Science churches, its religious inheritance makes the use of Classic Roman with its variants Colonial, Georgian, etc., the preferred type, and this has, with few exceptions, been the rule since the erection of the extension in 1904. All symbols, with one exception, are eschewed entirely, but the limited use of quotations in lettering is approved. The classic severity of the generality of the church designs makes simplicity of decoration and coloring rather to be preferred to sumptuousness of carving and enrichment of moulding, and quiet dignity to multifarious interest.



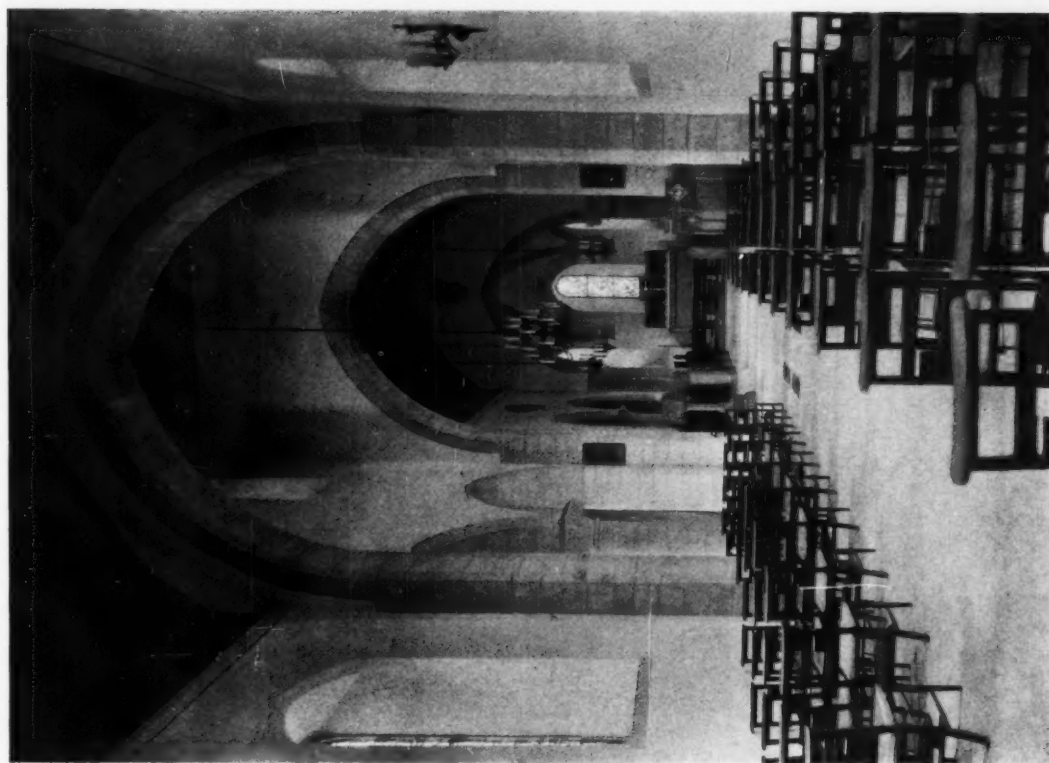
THIS rarely beautiful example of the small country church was made possible by the munificence of an individual donor who has provided in a crypt a mausoleum for the members of her family. The building, which stands in ample grounds of its own and suggests the wayside churches of Normandy or certain old country churches built in England during the Norman period, is of local granite with a square tower at the crossing, and the transepts which the cruciform plan has made possible are in effect chapels, that to the south having its own apse and altar.

Within the church the piers and the arches which carry the tower walls across the nave, transepts and choir, as well as certain arches elsewhere, are of granite, the walls themselves being plastered. Chairs are used instead of pews or benches for seating the congregation, and all oak woodwork is given the simplest of finish. While it has been built but a few years, the church has already become a treasure house of art in many forms, the result of the donor's interest and generosity.

ALL SAINTS' CHURCH, PETERBORO, N. H.  
CRAM & FERGUSON, ARCHITECTS

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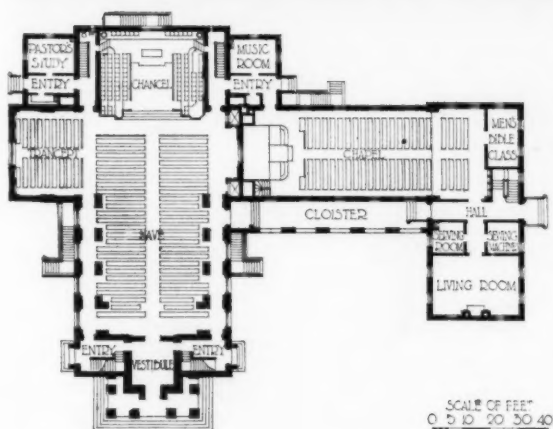
VIEW OF NAVE, CHOIR AND SANCTUARY  
ALL SAINTS' CHURCH, PETERBORO, N. H.  
CRAM & FERGUSON, ARCHITECTS



CHOIR AND SANCTUARY FROM CROSSING

*Photos. Paul J. Weber*

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THE suitability of the "New England meeting-house" type of church building to the needs of a present-day congregation is well demonstrated here. While it possesses a distinctly ecclesiastical dignity and churchly character, it is at once apparent that the church is intended primarily to be an auditorium for preaching rather than a setting for a liturgical service. With this end in view the auditorium here has been so planned that no columns prevent any of the worshipers from seeing the pulpit and preacher. The organ and choir seats have been located close behind the pulpit which is always an aid in conducting services where much depends upon the personality of the minister and the quality of the choir.

The exterior is rich in its restrained but graceful lines; the grouping of the various buildings is such as to enhance and emphasize the dignity of the church proper, and the materials, brick with stone sills and keystones, and wood trim, painted white, are those which, in addition to being the most appropriate for a building of this type, have the advantage of being comparatively inexpensive.

CONGREGATIONAL CHURCH, WELLESLEY, MASS.  
CARRERE & HASTINGS, SHREVE & LAMB, ARCHITECTS

see p 141

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ENTRANCE PORTICO AND CLOISTER  
CONGREGATIONAL CHURCH, WELLESLEY, MASS.  
CARRERE & HASTINGS, SHREVE & LAMB, ARCHITECTS

*Photos, Paul J. Weber*

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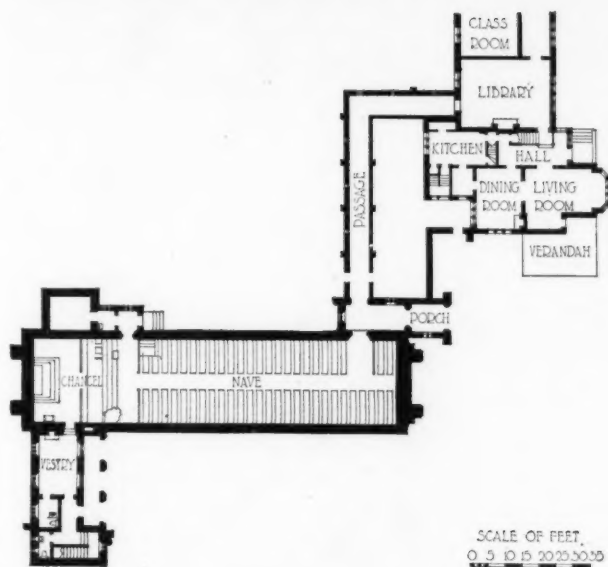
INTERIOR, LOOKING TOWARD PULPIT  
CONGREGATIONAL CHURCH, WELLESLEY, MASS.  
CARRERE & HASTINGS, SHREVE & LAMB, ARCHITECTS



AUDITORIUM AS SEEN FROM CHOIR

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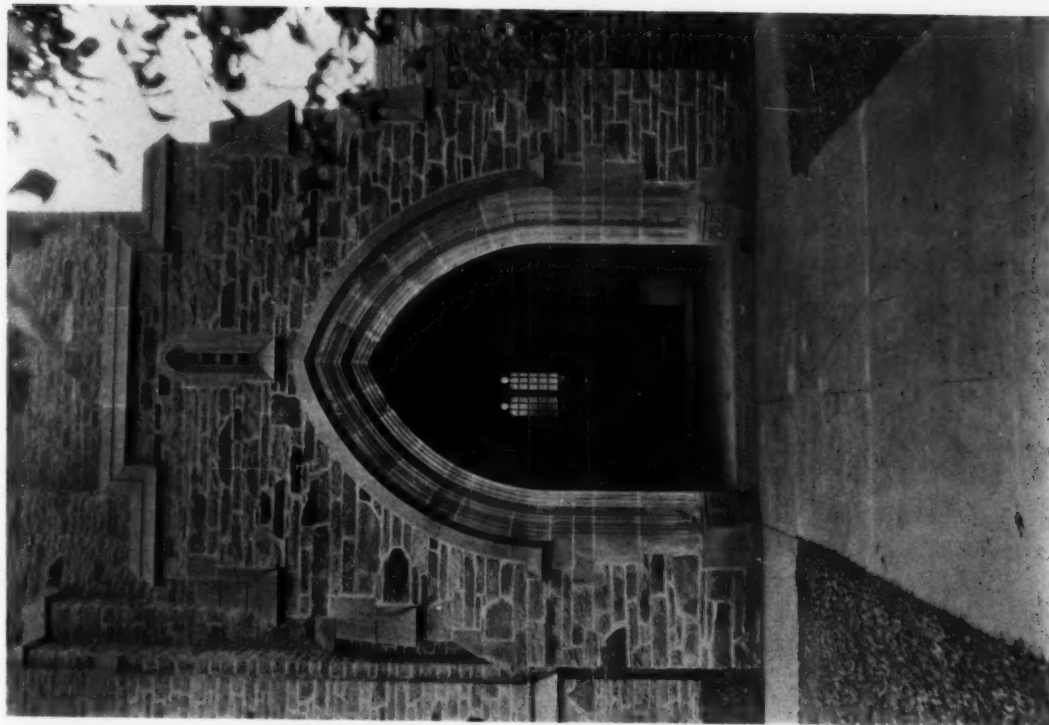


THE highly architectural dignity which characterizes this collegiate chapel group is due partly to its excellent design and the skillful placing of its different buildings, and partly to the use of materials which are appropriate for use in structures of this kind. Without and within the walls of the chapel are of a richly colored local stone laid up in ashlar, with cut stone used for jambs and sills of doors and windows, string courses and the tracery which fills various openings. Viewed from the entrance door by which the chapel is approached from the cloister the interior is impressive by reason of its length, its narrowness and its height, and by the placing of its windows high above the floor. The ceiling which is of heavy open timbers is supported upon corbels of stone. The roof timbers as well as the wood used for doors and for choir stalls, benches and other accessories are of oak with very little finish. The character of the entire interior with its stone walls and timbered roof is that of austere dignity, and it offers unusual opportunities for enrichment.

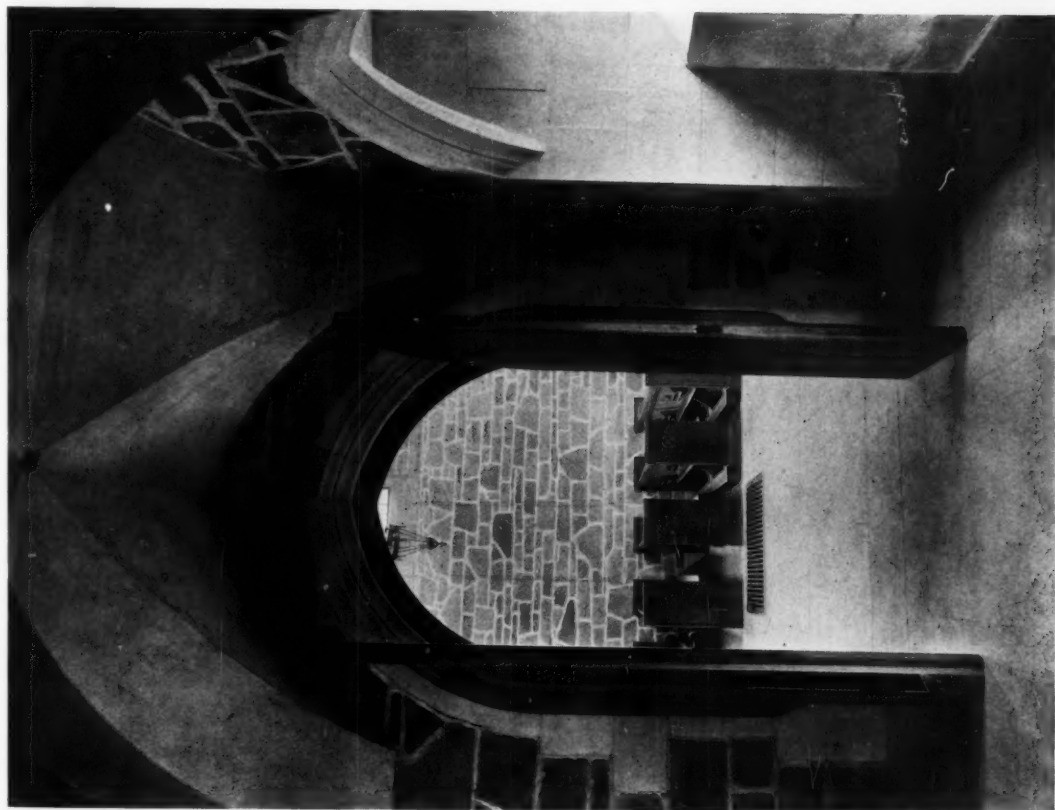
The various structures which compose this chapel group are admirably disposed in relation to the chapel proper which stands at the center, the long, low wing which contains the vestry and other departments being balanced upon the opposite side by the rectory and collegiate building which are joined to the chapel by the cloister.

MEMORIAL CHAPEL, BISHOP RIDLEY COLLEGE, ST. CATHERINE'S, ONT.  
SPROATT & ROLPH, ARCHITECTS

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PORCH ENTRANCE TO CHAPEL  
MEMORIAL CHAPEL, BISHOP RIDLEY COLLEGE, ST. CATHERINE'S, ONT.  
SPROATT & ROLPH, ARCHITECTS



NAVE, SEEN FROM CLOISTER  
MEMORIAL CHAPEL, BISHOP RIDLEY COLLEGE, ST. CATHERINE'S, ONT.  
SPROATT & ROLPH, ARCHITECTS

*Photos, Paul J. Weber*

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VIEW OF INTERIOR, LOOKING WEST



EAST END, CHOIR AND CHANCEL

MEMORIAL CHAPEL, BISHOP RIDLEY COLLEGE, ST. CATHERINE'S, ONT.  
SPROATT & ROLPH, ARCHITECTS

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# The Small Church

By ELMO CAMERON LOWE and FRANK G. DILLARD, Architects

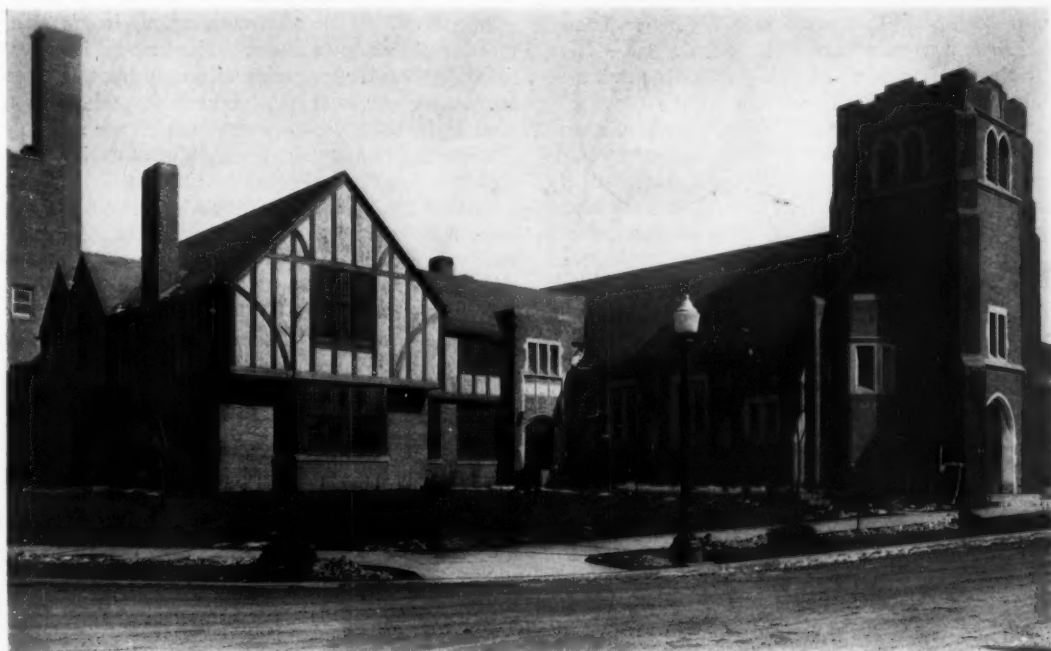
QUITE naturally, the small church is a product of missionary activity. It might be well to say at the outset that such activity, for both urban and rural districts, is a subject of very intensive study by theological seminaries and denominational missionary boards. This study is bearing fruit in development of outlook in many regards. Even in villages and isolated rural sections, the church is becoming more and more a factor in community life. Its program is being extended to include the full cycle of interests of both young and old; its contact with human life is constant—week days as well as Sunday.

This attention to the small church problem has resulted in much conscientious investigation along the lines of housing and equipment, and many useful articles have been written within the past few years on this phase of the subject. A series of articles by E. Donald Robb, which appeared in the *Brickbuilder* for October and November, 1914, is highly inspirational.

There is no reason for the small church building, no matter how simple and inexpensive, to be built in poor taste or, as is so often the case, in positive violation of principles of proportion and common sense construction. The small church should be, first of all, *modest*. It surely must be the prayer of all lovers of order and propriety that we may soon see the passing of the small church that apes

the more elaborate and costly structure. As Mr. Robb says, "We are all too familiar with the cheap and tawdry structures that masqueraded as churches during the period of artistic depression over which we have just passed, with their foolish wooden buttresses, pinnacles, galvanized iron crockets and contemptible ornaments of all kinds." After a rather expensive experience with the "common or garden variety" of present-day church builders, the writers are forced to the pessimistic and somewhat divergent view from that of Mr. Robb, that we have not yet entirely emerged from the "period of artistic depression." There are, however, indications that an increasing interest is being aroused within all communions on the subject of improving the standards of church building.

While the small church should be modest, it must not be cheap and flimsy. It must be purely functional in design, depending for its beauty on correct proportions, proper use of materials and effective ornamentation. Dignity should be the fundamental character of church design, and by careful attention to the factors just mentioned the small church building may be as dignified as the most noble cathedral. Because of the fact that they depend so largely on proportions, materials and restraint for their attractiveness, it is the opinion of the writers that the English village churches furnish the most suitable basis upon which to work. How divergent are the



First M. E. Church, Whiting, Ind.  
Lowe & Bollenbacher, Architects



Auditorium, First M. E. Church, Whiting, Ind.  
Lowe & Bollenbacher, Architects

examples of buildings falling within this classification; wonderfully fascinating little churches that accommodate but a handful of worshipers, and other churches of all degrees of size and fineness to structures that would please the richest congregations! In all of them, the chief charm is an honest and frank expression of construction and material. No shams—no covering up of “claptrap” construction anywhere. The village churches in some parts of continental Europe offer splendid examples for study; some especially attractive plastered buildings are to be found in Denmark. Wherever found, these structures are founded upon the same basic principles that make the small English churches so suitable for our inspiration.

Georgian and American Colonial types are very satisfactory, and in some sections may be more appropriate than the English. However, the tendency is so great in church buildings following these styles (judging from observation) to introduce cheap metal cornices and ornamentation, poorly designed stock columns and mouldings, and atrocities of belfries, that it seems almost unsafe to recommend them. The cost of upkeep of frame buildings is so high today that a great many congregations allow their buildings to fall into the sad state of deterioration so common throughout the country in this period of high costs.

There has been a tendency toward the Classical or “library” type of church building, especially in the middle west. All that has been said, regarding both cheapness of material and insincerity of construction in pseudo-Colonial churches, usually applies with double force to this much abused type of small church building. There is the added objection to the flat roofed, box-like structures of this classification that they do not look like churches,—they create no impression of religious character in the

mind of the average beholder.

There have been a number of small churches built of brick with very little stone trimming, that by the simple means of well proportioned openings, lowness of walls and steepness of roofs, are exceptionally attractive even though inexpensive. It is superfluous, in the face of what has been said regarding honest design, to introduce a word of condemnation of brick veneer construction, and our readers would not be offended by mention of it were it not that so many pastors and building committees have been misled into countenancing such construction by builders who have no regard for the principles that should always govern church building.

The practice of unintelligent copying is largely responsible for the terrible examples of church building to be seen on every hand. It is quite often due to a combination of incompetence on the part of the designer with ignorance on the part of the building committee. Church buildings above all other structures should be individual. Obviously this cannot be obtained by copying from some church that may have been seen by the committee in the adjoining village and to which they have taken a deep and unalterable fancy. The only course for a conscientious architect to take in such a case is to decline the commission, if his efforts at education are fruitless. The reason it may be safely assumed that such selection by the church leaders is poor is that at present (especially in the west and middle west) poor examples are sadly predominant. If our church buildings could be designed in the devoted spirit of English Gothic—even if not in detail—and if church building committees were wise enough to employ only such architects as really experience this spirit, we should within a short time see an improvement in church building.

In connection with church work, the intelligent architect has an opportunity—one might almost say obligation—of exercising his highest calling, that of developing an appreciation of the beautiful. Mr. Robb, in the article already referred to, sets a high aim for architects in this most appropriate way: “As art is the reflection of spiritual conditions, we cannot hope to properly establish a study of religious art without first producing those conditions which nourish and encourage its growth. . . . Art is one of the most potent factors at the command of the Church, and did she but know it, one of the strongest agencies in freeing the people from that spirit of commercialism and materialism which is her worst enemy at the present time.”

The architect must fully understand the function



of the church, and in full sympathy lead the congregation to paths of high aspiration. Ralph Adams Cram, in his "Church Building," tells us something of the devotional spirit that should actuate the church builder. Could anyone, after reading such an inspiring thesis, resort to cheap substitutes for permanency? On account of the very pressing need for economy in small church building, the most durable local building material should be selected, and the design of the structure largely developed from that starting point. When it can be secured reasonably in cost, stone is the most desirable material for walls. Frequently, in cases where the cost of stone seems prohibitive, an investigation of conditions will reveal possibilities for securing it at a cost within reach. An important church building was recently constructed with walls of beautiful ledge stone scrap from a distant slate mine, the cost of which was only the freight charges. In very small church buildings, the side walls can be kept quite low; a stone wall even to sill height with stuccoed tile above it can be made very effective.

Kiln-run red brick laid in uncolored mortar is the next choice for walls. Plain segmental or pointed segmental arches are effective in brick walls, and double reveals are sometimes advisable, especially where vertical lines should be emphasized. Gray slag brick is quite inexpensive in some sections and can be used quite effectively in certain types of buildings. Many recent small church buildings have been built with stucco finish over tile, concrete block and even wood frame. The use of stucco requires especially careful attention to the relation between wall surfaces and openings and to the texture of the finish.

No dependence should be placed upon applied ornamentation in small churches unless it be to use at some effective point a bit of stone carving that is of real artistic value. It has already been suggested that art in the small church must be expressed by structural integrity and good proportion. However, if the funds will permit it, a concentration of richness will be of great value—much more than tawdry, cheap ornamental details scattered about with a free hand. One important window, with well executed stone tracery, and all others in plain brick openings with brick sills is better than to have all of the windows in the customary more or less elaborate and expensive wood frames that pretend to imitate tracery. It is a form of hollow mockery.

Considerable study should be given to fenestration. A common fault of the kind of church build-



Sunday School Room, First M. E. Church, Whiting, Ind.  
Lowe & Bollenbacher, Architects

ings that are produced in wholesale lots is an absolute lack of scale between openings and wall surfaces. Almost always the windows are too large, and they are quite sure to be beautified (?) by the ugly wood frames already mentioned. There are now on the market several makes of steel casements that should be a boon to the designer of small, inexpensive churches. Single units are about 20 inches wide, which is as wide as single windows should be for the type of building we have in mind. These frames can be had without muntins if leaded glass is desired. In some types of building the standard size of panes will be in good scale. Sills should be at least 4 feet above the floor line. If the glass is to be leaded, a thoughtful architect will insist on the absolute simplicity of diamond or oblong quarries of delicately tinted cathedral glass, no matter how loudly the congregation may clamor for "art glass."

As just suggested regarding tracery, one especially prominent window of well designed glass will be very effective if it can be afforded. If steel windows with standard muntins are used, figured glass or light amber cathedral glass will be satisfactory in most types of small church buildings. All Sunday School and social rooms should have windows glazed with clear glass. Especially designed doors with suitably wrought iron hardware should be provided for the entrances.

The roof of the small church is an important feature. In the first place, it should be perfectly plain in construction and designed for its fundamental function of discharging rain and snow as effectively as possible. A pitch of about 50°, or somewhat steeper, will be found to be of value both for appearance and construction. Steep roofs are especially good if the building is without a basement and the walls consequently low. A roof that is thus made so important a part of the building should be

covered with a good quality of slate of graduated or staggered thicknesses and variegated colors to insure good texture. This is an expense that will justify much economy elsewhere in the building.

Restraint should be exercised in designing the interior of the building as well as the outside, and the general principles suggested here should prevail throughout. Whatever elaboration of detail can be afforded should be centered in the chancel. Church floors should be sanitary, solid and noiseless. It is always desirable, from the standpoints of exterior appearance and accessibility, to have the auditorium floor only slightly above grade. When this is possible, the sub-floor can be of concrete laid on fill. For floors of this kind, slates, flagstones or tile are good materials for the aisles, and the spaces under the pews can be cement finished. Composition flooring, battleship linoleum or cork carpet over concrete or wood base will be satisfactory for more economical construction. Flooring in the chancel should be of better material than elsewhere in the building. Dark colors should be used pretty generally throughout. If the building has a narthex, it will be well to enrich its floors somewhat beyond that of the main floor of the church proper, possibly by using the material that is used for the aisles. All Sunday School and social rooms should have wood floors, stained dark and finished in harmony with the general character of the building.

Open construction of roofs is most desirable. It gives height to the interior and also truthfully shows construction. Very often the church committeemen will fear the use of exposed trusses because they may be aware of the high cost of casing the steel trusses of a church in some neighboring town; but it should be pointed out to them that solid wood trusses, in which the rough timbers are exposed and stained, can be built for as little outlay as would be required for casing all the members of complicated steel trusses. For the small church with a roof span of 25 or 30 feet, solid wooden trusses are very suitable. The plain "scissors" truss (especially for steep pitches) is comparatively inexpensive. Its members can be either solid beams joined carefully or built up of 2-inch boards with finishing boards over the under surfaces to conceal joints. There are for the small church builder many possibilities in the field of wood truss construction. We have seen some examples of wood and rod trusses that are quite pleasing and not very costly to construct. In trusses of this character, the usual long, level, lower chords can be relieved by bolsters and brackets. In some of the best recent types of small rural church building, the ceiling is plastered on scissors trussed rafters with collar beams and knee braces arranged so that the faces of the ceiling with the side walls form, in section, half of an irregular dodecagon, side windows penetrating the lowest sloping surfaces.

In buildings such as we have under consideration, and even in larger churches, side walls can be very simple indeed. Lime plaster is best for acoustics.

We would suggest that jambs and heads of window openings be plastered with the surfaces splayed. By this method considerable expense can be avoided on account of the omission of the wood trim. In some types of rooms for worship a wood wainscot to the height of the sills will be very satisfactory. Such wainscoting may be made of matched and "V" jointed boards of uniform or alternating widths, stained a dark weathered wood color.

If any enrichment can be afforded in painted ornamentation, it should be confined to the chancel. Wall decoration in most small churches will necessarily be plain, and unless such enrichments can be of high artistic quality they should be confined to modest stenciled borders or omitted entirely. A rich border, introducing bright colors, can properly be carried around the chancel arch. Bright colors can also be used with great effect on roof members, but such treatment should be carefully studied.

The simple oblong room, which was considered to be the best plan for the little Gothic churches of England, has never been improved upon. Today our most successful small churches are of this type of plan. A great advantage is gained in the simple dignity and also in reduced cost. What a contrast in repose there is between a church of this kind and the very common type in which the interior is square, with pulpit in one corner, entrance in the opposite corner and the sides full of barbaric windows of gigantic scale, penetrating the sloping ceiling in all kinds of disorderly intersections!

If there is to be provision for emergency seating space, this can be taken care of by a small gallery over the narthex, and perhaps transepts, one of which can be shallow and used for the choir, the other larger to serve, in addition to seating space, for a prayer meeting room or chapel. If the church can afford to build an aisle on one side, this space can also be used for extra chair seats. The Sunday School and social needs of the church and community must be provided for in a closely related annex,—preferably a wing. The actual cost and prospective needs along these lines should be carefully considered in the light of modern religious educational programs.

The reader will have noted before this that we have endeavored herein to reduce this proposition of church building to the financial ability of poor congregations, presumably of non-liturgical denominations; there are so many of them throughout the land, and they deserve better treatment than is usually accorded them, even though it may at first be hard to get them to accept the treatment. Architects of ability should help such congregations to do right in building, even if it means sacrificing regular fees. This is not advocacy of doing church work for nothing (the architect must be his own judge in that regard); it is rather an attempt to stimulate an effort toward correcting the common practice of poor churches, that is of building from drawings made with no thought of the fitness of things.

# Sunday School Requirements

By HENRY EDWARD TRALLE

**C**HURCH architects today are confronted, at the very threshold of their planning, with an educational and an ecclesiastical problem.

*Church House and Schoolhouse.* A church house today implies also a schoolhouse, and a schoolhouse in connection with a church house must mean exactly what schoolhouse means anywhere else—a building adapted to educational uses. This schoolhouse, therefore, must be a building complete in itself, and must be used only for distinctively educational purposes. It cannot be a mere space in a church auditorium, or a mere enlargement of such an auditorium with a movable partition on the side toward the pulpit for partial separation. Nor can it be a basement room that is used also for social purposes. To put a Sunday school or any part of it into a basement room is an abasement of religious education. Nobody would think of putting any other kind of school into a basement, and why should the Sunday school, of all schools, be thus mistreated?

The church, of course, should have a recreation room, but even this room should not be in a basement, and, wherever it is located, it cannot be effectively adapted to educational uses. This recreation room can be used for social functions, entertainments, games, and even as a dining room, but not as an educational room.

The church school is developing an educational consciousness, and is realizing as never before that a school, whether it be called Sunday school, Sabbath school, Bible school, or church school, implies a schoolhouse and school equipment. The Sunday school at the beginning was allowed to come into the church on sufferance, and to occupy a corner of the church auditorium. Then, as it grew, a room was built for it on one side of the church auditorium, with a movable partition between, so it could be used also as an enlargement of the auditorium on occasion. This added space was not a good room for a school, and it had the same effect upon the appearance of the auditorium that a good-sized wart would have on the side of a woman's face—but it got the Sunday school off the carpet in the auditorium, and saved the sanctity of the sanctuary!

The next step in building for the Sunday school was the placing of irregularly shaped classrooms around two or three sides of this added room, each room separated from the other rooms only by thin movable partitions, open in front, or else with curtains. Sometimes this added Sunday school room was semi-circular in form, with two tiers of partial rooms or stalls around the semi-circle, one above the other, and a high ceiling for the rest of the large room. This two-deck "side-wheeler" was designed for the old fashioned one-lesson, one-assembly Sunday school, and belongs now to the educational.

museum, since the Sunday school has developed into a departmental, graded institution, demanding for itself a complete schoolhouse, with assembly rooms and classrooms.

*Spaces and Proportions.* This schoolhouse needs to be large enough to care for the school of the church in departments and classes, allowing 15 square feet of floor space per individual pupil. A school with 600 pupils, for example, will require 9,000 square feet of floor area for assembly room and classroom uses. An allowance of 16 square feet of floor space per individual pupil is liberal, and is considered by some to be preferable, while, on the other hand, an allowance of only 14 square feet of floor space per individual makes good educational work possible. These statements regarding floor space requirements are made on the basis of many measurements and observations and comparisons, and may therefore be accepted as a working basis in planning the schoolhouse of the church. Additional spaces, of course, must be provided for corridors, stairways, toilets, offices, etc., as these are not included in the provision of 15 square feet of floor space per individual, though the 15 square feet may include the spaces occupied by partitions between rooms.

In general, it may be said that the average church will need to provide, in its schoolhouse, for approximately the same number of individuals that its church auditorium will seat, and since about double the floor space per individual is required in the schoolhouse as is required in the auditorium, this means that about the same amount of ground area is required for the schoolhouse as is used for the auditorium, inasmuch as the schoolhouse is usually a two-story building, though it may be only one story high where there is an abundance of ground space, and it may be even seven stories where ground space is limited, provided elevator facilities are afforded.

This general statement regarding the total of ground space and floor space required for the educational work of the church presupposes that the church auditorium will be also the general assembly room for the Sunday school for its occasional meeting as a whole or, less preferably, that the recreation room will be used for this purpose, as it is considered that the occasional assembly of the whole Sunday school in the church auditorium is in itself good religious education, aside from the material saving in construction costs. When a church erects a second auditorium large enough to accommodate its school as a whole, "the Sunday school room," it is duplicating in effect what it already has in its church auditorium, and this cannot often be done.

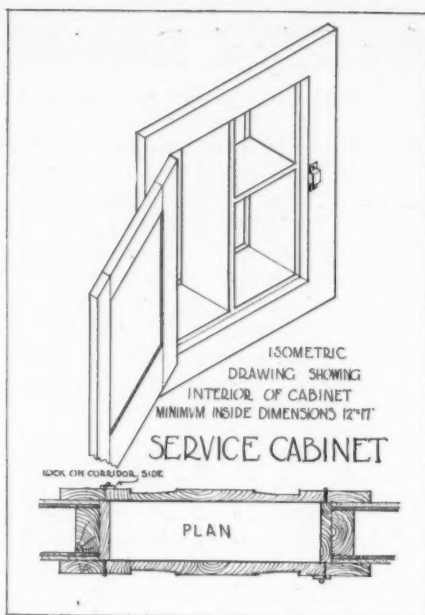
The total floor space in the schoolhouse of the



church should be suitably apportioned to the several departments of the school. The proportions, for the average school, will be about these: Cradle Roll and Beginners, ages from about 3 to 5, 10 per cent; Primary, ages 6 to 8, 10 per cent; Junior, 9 to 11, 10 per cent; Intermediate, 12 to 14, 10 per cent; Senior, 15 to 17, 10 per cent; Young People, 18 to 23, 20 per cent; Adult, 24 and over, 30 per cent. This means that for a school of 600, for example, with a total of 9,000 square feet of floor space for educational uses, 900 square feet will be assigned to each of the first five departments named, 1,800 square feet to the Young People, and 2,700 square feet to the Adults. If the adults use the church auditorium or the recreation room for assembly, or if the adults hold no assembly for the adult department as a whole, as is frequently the case, then it is not necessary, of course, to provide an adult assembly room at all. In this case, in building for a school of 600 pupils, there will be left of the total of 9,000 square feet of floor space, after providing for all the departments, sufficient space probably for corridors, toilets and the other needed facilities. The heights of assembly rooms and classrooms in the schoolhouse will vary from 8 to 12 feet, according to the size of the school and of the assembly rooms, and the average ceiling will be about 10 feet in height.

The proportionate sizes of the departments in the Sunday school will vary greatly, as a matter of course, in different localities, and the approximate average proportions as given here are useful only as a basis of comparison in planning. The architect, however, should be on his guard against planning in accordance with present existing proportions in any given school, as these proportions may be materially changed with a new building and suitable equipment. The present number of Intermediates, for example, may be relatively small on account of lack of adequate departmental provision, and might easily be doubled within a year in the new schoolhouse. The same might be true of some other department. Furthermore, in general, provision should be made for the growth of the school, except in the exceptional community where it seems to be evident that no considerable increase in attendance can be expected, even with improved facilities.

As to the location of the church schoolhouse in relation to the church auditorium and the recreational room, no hard and fast rule can be laid down. It depends on the size and shape and slope and



Suggestion for Receptacle for Records

surroundings of the church lot. The schoolhouse may be under the same roof with the church auditorium, or under a separate roof, but the two buildings should be close to each other, with easy intercommunication, and with at least one solid, soundproof wall separating the one from the other.

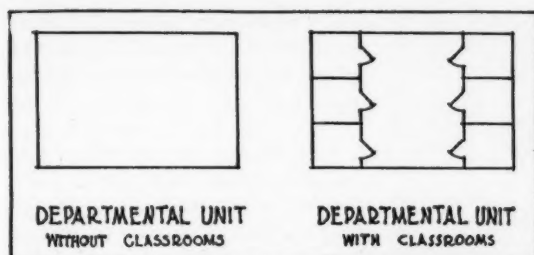
*Assembly Rooms and Classrooms.* A schoolhouse is not a schoolhouse unless it contains classrooms, one for each class; and a classroom is not a classroom unless it has soundproof walls and actual doors opening into a larger assembly room or a corridor. Every teacher needs for his class alone a room with four soundproof walls, for the common sense reason that all sights and sounds coming

from any source other than from his own particular group are of necessity in the nature of distractions and make impossible his best teaching. Any teacher can do far more effective teaching with his class alone in an individual classroom than in the midst of hubbub where there are seven or seventeen classes being taught at the same time in the same room. This truth holds with the classes of younger children as well as with the classes of older pupils. If the children in the Beginners Department are divided into classes for a part of the school session, then each class needs its own small room—for the same reasons that the department as a whole needs its own separate assembly room for its distinctive departmental work. The superintendent of the department needs an assembly room in order to handle effectively the whole department as a unit, and, for the same reasons, each teacher needs a classroom in order to handle effectively her class as a unit. Indeed, the younger the children the more they are influenced by their material surroundings, and the greater the necessity therefore for classrooms as well as assembly rooms.

*Sizes and Proportions of Rooms.* The floor space of each departmental unit should be divided between assembly room and classrooms in the proportion of seven to eight, each pupil being allowed 7 square feet of space in the assembly room and 8 square feet in the classroom. The allowance of 7 square feet in assembly room provides also for aisle, piano and partition spaces, and the 8 square feet in the classroom includes the space needed for partitions.

In a school of 500 or 600, the Beginners will require four small classrooms, about 8 by 10 feet each, in addition to the assembly room. In the Primary department there will be needed six class-





rooms, about 8 or 9 by 10 feet, in addition to the assembly room. There should be a Cradle Roll room and a Mothers' room, both near the Beginners and Primary units, but with no direct connection with either. In a school of the same size there will be needed six classrooms in the Junior department, six in the Intermediate department, and six in the Senior department. In each of these departments it is advisable to have the classroom a little larger than in the Beginners and Primary departments, and to make the assembly room proportions a little smaller if necessary. For the Young People there will be needed at least four classrooms, which should be considerably larger than the classrooms in the departments already mentioned. At least four adult classrooms will be needed. The largest adult classroom should be on the first floor if possible, easily accessible from the street, and it might be used for various other purposes—prayer meeting, missionary meetings, conferences, social functions, etc. It is advisable, usually, to have the younger children on the first floor, though this is not absolutely necessary. In planning for a small school, each departmental unit may be divided into three rooms, one room larger than either of the other two, to be used as an assembly room and also as a classroom.

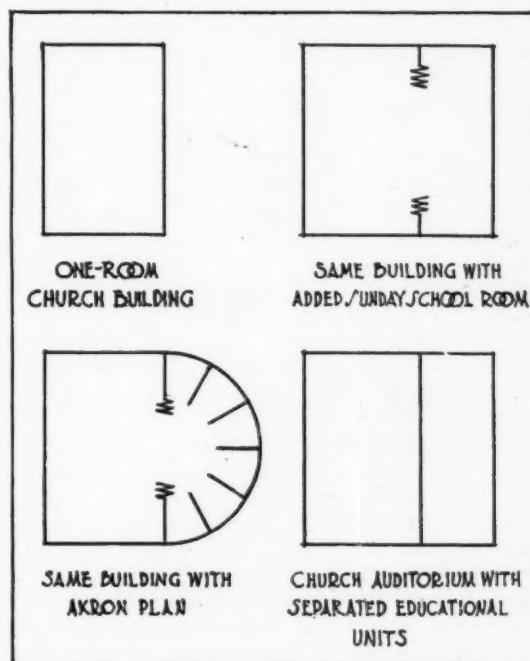
It should be kept in mind that the requirement of 15 square feet of floor space for each individual holds even where there are no classrooms, when all the classes of a department are handled in the one large room, the members of each class being seated around a table. In this case there must be left, between class and class, room for the free movement of the workers, and there must also be sufficient floor space between classes to make possible a fair degree of removal of class noises from class noises.

In other words, the addition of six classrooms in a Junior department of 60 members, for instance, does not increase the total floor space of 900 square feet, but only effects a better utilization of the space, and therefore makes the cost of classrooms less than the small cost of the separating partitions, for the reason that these partitions save practically their own cost, because their presence lessens the dimensions otherwise necessary for floor and ceiling girders and beams to span a larger one-room space. When this type of construction, with assembly room and classrooms, is compared with the obsolete "Akron" combination of high room with two tiers of "stalls," its cost is materially less, for the reason that it utilizes the upper half of the space that is

obviously wasted in the other type of construction.

Of course, it never should be permitted that an argument for economy prevail when the educational interests of childhood and youth are at stake, but frequently I have been compelled to resort to it in order to get a church building committee to adopt classrooms. When I assumed the initiative in advocacy of separate classrooms with permanent partitions, in the church schoolhouse, beginning in 1906, in connection with my educational work, I invariably met the objection that the idea was an ideal that was impossible of attainment, because of the prohibitive additional cost of classrooms. In seeking to meet this objection I discovered, in 1910, that it was possible to have classrooms, in addition to assembly rooms, without increase of floor area, and with practically no additional cost, and, since that time, I have demonstrated this fact in various buildings in different sections of the country, and have advocated in my writings and in my addresses in 34 states of the union and with classes in schools, classrooms with permanent partitions and hinged doors for all the classes in the Sunday school. Both the advisability and the practicability of such rooms now are quite generally accepted by the church leaders in practically all the denominations, though there are church committees here and there that still need to be convinced.

*Various Other Provisions.* It is advisable usually, for various reasons, to depend on natural ventilation in the schoolhouse of the church. It is desirable, therefore, that each classroom have at least one outside window, and that each assembly room have at least two outside windows. It is necessary, sometimes, in order to secure outside light for the class-





Assembly Room, New York Bible Society Building  
Wilfred E. Anthony, Architect

rooms, to locate them so that each will open into a corridor, instead of immediately into the assembly room. Proper ventilation will be greatly facilitated if each window is provided with a transom, opening from the top inward, with regulating attachment making adjustment possible. This arrangement will give ventilation without drafts. The windows themselves, of course, should be made to raise and lower. Pupils may be protected from drafts from the bottoms of windows by sloping glass shields. All inside classroom doors and assembly room doors should have transoms, for ventilation. Good ventilation is a prime requisite for successful work.

All classrooms and assembly rooms should be well lighted from the outside wherever it is at all possible. The light should be diffused as far as practicable, and should come from the rear and sides of each room. Obscured glass is preferable to clear glass, since it aids in the diffusion of the light and also increases the effect of separateness and of coziness within the room. Glare should be eliminated by means of double shades on rollers.

Care should be taken to provide adequate corridors and stairways. All connections should be as

direct and easy as possible. Offices and library rooms will be needed in the schoolhouse of the church. Adequate and convenient toilet facilities should be provided, particularly for the lower grades. For the Beginners department, there should be provided a cabinet for supplies and a room for wraps. The same provision is needed for the Primary department. The room for wraps should be so constructed as not to interfere with the symmetry and beauty of the assembly room, or of any classroom. Above the Primary department, each classroom should have its own provision for wraps and for supplies. Usually it is advisable to provide such facilities at one end of the classroom. Each classroom should be provided with a receptacle in the partition for its records and offering, with a small door opening inside and another opening outside, for the lessening of classroom interruptions. It is advisable for each classroom door to have in it a glazed slit, to facilitate inspection by officers and visitors without interruption of class activities.

Each classroom should have a small blackboard, to be used by the teacher principally and occasionally by a student. This blackboard should be placed as inconspicuously as possible. If built in, it should be covered with a curtain when not in use, or preferably by doors or panels. Some teachers prefer a lightweight portable blackboard. In every classroom there should be a few well selected, graded pictures. All pupils should be seated comfortably and conveniently, using chairs which should correspond in finish with the finish of the room and be in harmony with its color scheme. Student chairs, with table-arms for writing, are desirable for all classes above the primary grades.

All classrooms and assembly rooms in their interior finish and trim should express the best in ideals and practice, and the color schemes and decorations should be such as will develop in the pupils a sense of comfort and well-being, as an aid in religious education. In rooms having an abundance of direct sunlight, the cooler tints of green, blue-green, light blue, and gray should prevail. In rooms with less light, the warmer tints of yellow, or orange-yellow, should prevail. The stronger tones of blue and of red should be avoided, because such colors are trying to the eye and promote restlessness on the part of the pupils.

## ✓ Stained Glass Construction and Details—II

By WILBUR HERBERT BURNHAM, *Artist-Craftsman*

*With Illustrations by the Author*

FROM the early Christian period, decoration, in its various forms, appealing to the sense of beauty, has been pressed into service to memorialize the dead. The art of stained glass, while it is not as ancient as other mediums of expression, has for centuries been utilized to commemorate the virtues of the departed. For the Christian memorial, stained glass is the supreme expression in terms of color, for in this medium, as in no other, pure transparent color is enhanced and glorified by the light of heaven, without the aid of which it possesses little interest.

It was during the great period of Gothic architecture that stained glass, presumably the outgrowth of the enamelers' art, had its real beginning, and under the patronage of the Church the art flourished, reaching its zenith in the twelfth and thirteenth centuries, notably in France. Even to this day, in spite of its fragility, the cathedrals and churches of France, and in many instances, England, are aglow with marvelous gem-like windows,

the work of master craftsmen of the middle ages.

If we study the work of these mediæval craftsmen, we find what their medium was truly meant for. A pleasing harmony of pure color, good design and leading, the essential factors upon which stained glass must depend, were forever before them, and the innumerable examples of their genius for centuries inspired lovers of color. Why is it that we today cannot make windows like the old examples? Has the art been lost? Surely, every worker in stained glass has been asked these questions many times. Although the art itself has never been lost, a proper appreciation for its basic principles was for centuries almost entirely forgotten, resulting in a vast number of ugly pictures in glass,—the result primarily of the advances made in the technique of painting.

Fortunately, the art of stained glass is again taking its rightful place in the art world, and the numerous beautiful windows, made in America and installed in our American churches, bear eloquent



Cartoon for a Window of Four Lights

*By Wilbur Herbert Burnham*





Fig. 1. Lead

Form of Strips Used for Leading



Fig. 2. Steel wheel.

Diamond.

Tools for Cutting Glass

testimony to the progress made by several of our craftsmen. This new uplift of an otherwise degraded art is in no small part due to the progress and achievements of thoughtful architects. Their development of ecclesiastical architecture has inspired many of our younger craftsmen to loftier ideals, and through intensive study of the masterpieces in France and England they have become imbued with the spirit of mediæval work, and do not expect their artistic efforts to attain the impossible. To be sure, a modern spirit in design and drawing is evident, and it should be; for after all the naively drawn, and as some writers have expressed it, crudely drawn, figures of the earliest work, are not an essential part of the craft.

As regards stained glass, few people in almost any community are familiar with the art. Indeed, outside of the fact that glass is employed, they have no idea of the craft, nor do they even pretend to know what they admire. A stained glass window is composed of small pieces of white and colored glass held firmly together by strips of grooved lead (Fig. 1) soldered at the joints. It must be clearly understood that the color, the real glory of stained glass, is not painted on the glass, but is produced when the glass is manufactured. Various metallic oxides mixed with the glass while it is in a molten state produce the coloring. It can be readily seen that whenever a change in color is desired in a window, a separate piece of glass must be cut. With a few exceptions, the color pervades the whole piece of glass, and its unequal thickness makes the thin part light and the thick part dark. "Flashed" glass is white glass covered with a layer of colored glass. Beautiful effects can be obtained by eating away parts of the colored glass with hydrofluoric acid. Modern glass manufacturers are making flashed glass in various colors, all highly useful to the artist. The only paint used in the making of a window is an opaque, vitrifiable pigment, used merely to delineate form and detail. No actual color is ever

painted on the glass, except a "stain," an early fourteenth century discovery. White glass, with the use of this stain, produces, after firing in a kiln or oven, a beautiful transparent yellow varying in tint from a light lemon yellow to a rich orange.

Although modern manufacturing assists the present-day craftsmen, the same processes are employed as in the middle ages. In place of moulding the lead by hand, the modern workers buy it all manufactured in various sizes and shapes. Gas and electricity now take the place of charcoal for heating the soldering irons, while the diamond or steel wheel (Fig. 2) is used to cut the glass in place of the primitive method of drawing a red hot iron across the glass, and with sufficient hand pressure breaking the glass in two.

Like other technical arts, the conception and development of stained glass necessitate the employment of several trained craftsmen. As in the mediæval days, the window designer should be a thorough craftsman, capable of not only designing, but painting on the glass and if necessary, leading the window. The general custom of having a worker do one special detail of work and no other is a detriment, and tends to a mechanical sameness in execution. No really serious work is ever

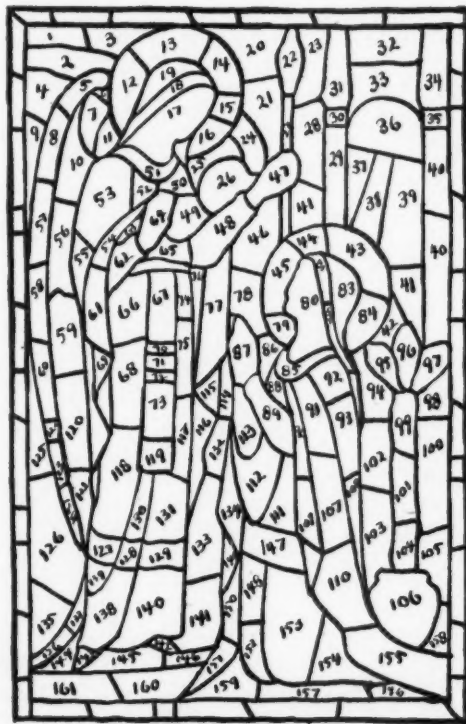


Fig. 3. Cut-Line-Drawing.

Working Diagram for Cutting Glass  
Pieces Numbered for Workman's Convenience

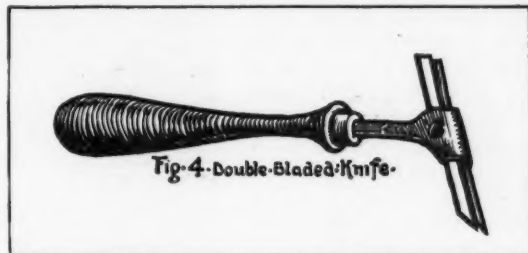


accomplished unless the group of craftsmen work together in perfect harmony, all striving to produce, not a mere window but a work of art.

When a glass designer and craftsman is commissioned to make a window, he should first of all, whenever possible, see the building his window is to adorn and study very carefully its lighting conditions and architectural surroundings. Alas! too many of our churches are already filled with windows in which styles and periods have been sadly mixed,—the result in many instances, however, of personal tastes. Now, thanks to many of our architects, even the so-called commercial glass men must keep within certain limitations.

The preliminary design in water color, drawn to scale, serves as a working model for the artist and gives to the client an idea of the appearance of the completed window. After the design has been approved, the next step is to draw the "cartoon," or full-sized drawing in black and white. In this drawing all the details, including lead lines and "stay bars," of which mention will be made later, are very carefully drawn, for this is the most important drawing of all. The cut-line drawing (Fig. 3) which follows is a tracing of all lead lines and bars. This drawing when completed shows very clearly the various shapes and sizes of the glass, and to offset any future difficulties, the shapes are numbered. Later on, when the window is ready for leading or glazing, the cut-line drawing will serve as a guide. With the aid of transfer paper a duplicate of the cut-line drawing, called the pattern drawing, is then made on heavy paper. This drawing is cut into separate patterns with a double-bladed knife (Fig. 4), but before cutting the patterns are numbered as on the cut-line drawing. The double-bladed knife cuts the patterns and at the same time cuts out a thin strip of paper, or allowance, for the "heart" of the lead as the center is called. It can be readily seen that without the use of numbers it would be extremely difficult to determine the correct position of each piece of glass, once it is cut. Now, with the water color design as a guide, the colors are selected and with a diamond or steel wheel, the glass is cut to conform to the various shapes of the patterns.

Then the artist places the pieces of glass upon the cartoon, and traces all drawing lines and details on the glass with the vitrifiable pigment mentioned before. For tracing, varnish and turpentine are usually mixed with the pigment, although certain workers



Knife Used for Cutting Drawing

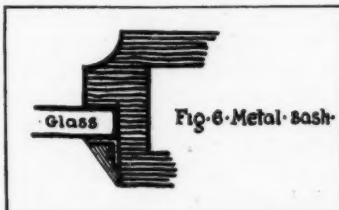
prefer mixing water with the color, which is either brown or black. To prevent any possibility of losing the trace lines in the next process, the glass should be fired in the kiln until the painted lines actually become a part of the glass.

For the ensuing process of painting, it is necessary to set the window in place before the light. A large plate glass easel is therefore placed on a flat bench, with the cut-line drawing placed beneath to aid in solving the puzzle, for each piece of glass must be laid on the easel in its correct position. The pieces of glass must not touch each other, because the allowance for the heart of the lead used later on is necessary. Melted wax is dropped into these spaces at intervals, causing the pieces of glass to hold firmly to the easel. Now, by placing the easel in an upright position before the light, the window is seen for the first time, and any color changes desired are made. Since in the finished window, black lead lines will take the place of the brilliant white lines now visible between the pieces of glass, the spaces are filled, or should be if the craftsman is in love with his work, by filling in with a black paint.

The next step in the painting, the shading so-called, is best when simply done as in the work of the middle ages, but if overdone—and this is where for centuries workers in stained glass sinned both as artists and craftsmen—the window becomes a lifeless, opaque creation. Each piece of glass is covered with a mat of the same pigment used in tracing, with gum arabic as the adhesive medium and water to thin the color. When the color is dry, lights are taken out with a bristle brush or with the finger and palm of the hand, leaving only enough paint to give to the glass an interesting texture, and which if thoughtfully and lovingly done, will mellow the color of the glass without causing loss of any of its particular gem-like brilliance. In approaching the painting of a window, the



Grooves for Holding Glass



Glass Held in Metal Sash

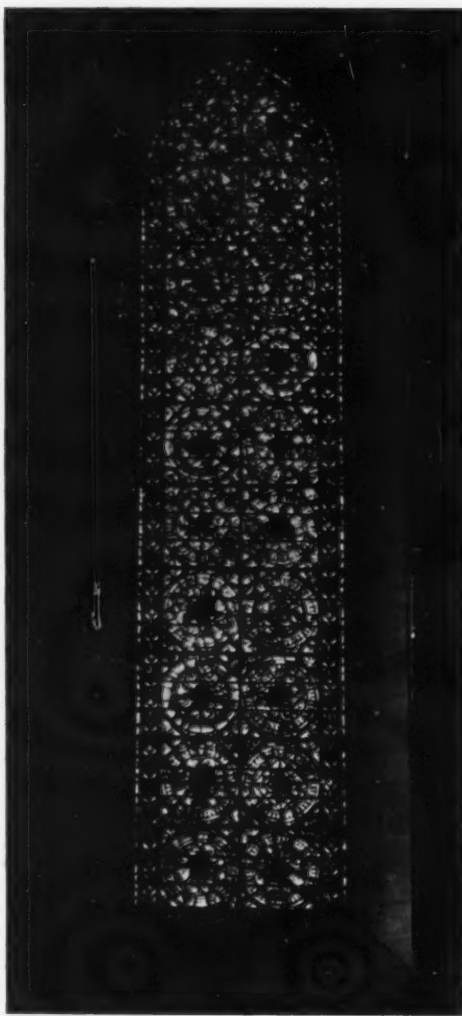
average glass painter pays but little attention to the distance the window is to be seen, painting a clerestory window as he would a small window that is to be seen at a close range. This is wrong. Light plays many tricks when shining through glass. A clerestory window must be painted boldly, with the use of heavy trace lines, getting a result that is strong in design and rich in color.

With the painting completed, the pieces of glass are removed from the easel and fired in the kiln so that the painted surface feels smooth. Again the glass must be waxed up on the easel and painted for the second time, for the intense heat in the kiln has probably reduced the paint and in some cases burned it almost entirely away. Even a third painting is not infrequent, and a special firing for stain gives the most satisfactory results.

The glass is now ready to be leaded. The cut-line drawing is laid on the glazing bench; a straight edge of wood is nailed to the base and a piece the length of the drawing to one side. Long strips of wide lead are placed against these wooden bars and, beginning in the corner, a piece of glass is fitted into the grooves of both leads. A strip of smaller lead is now cut long enough to cover the opposite sides of the piece of glass, and into the free grooves of this lead the next piece of glass is inserted, and so on, until all the pieces are leaded and the joints soldered.

The window is now complete as a work of art, but one more process is necessary before the window can be installed. The window is laid on a flat bench and completely covered with a waterproofing cement, composed of Portland cement, whiting, lampblack, boiled linseed oil, turpentine and a patent dryer. With a stiff brush the cement is rubbed into the leads on both sides of the window, and after cleaning off the glass, the cement is allowed to dry and harden.

To enable the window to resist wind pressure, horizontal iron bars are fastened into the window sash at intervals, and to these bars the window is



A Famous Window in "Grisaille," North Transept, Salisbury Cathedral

joined by small pieces of copper wire soldered to the lead and twisted around the bars. In early windows these bars frequently were bent to conform to the designs of the windows. Especially in the late thirteenth century, when the great medallion windows were made, the bars were a governing factor in the design, and these heavy black lines gave contrast to the color and strength to the design.

In the setting of a window the glass worker is frequently confronted with difficulties. When a window is to be set in stone, the grooves are sometimes made too shallow, and the setter finds it necessary to take the window apart at various places in order to insert the glass into the grooves. Whenever the stonework is intricate in design and construction, this cutting apart cannot be avoided. However, if the grooves are made deeper on one side than on the other (Fig. 5) the setting will be made easier, for after inserting the glass into the deep groove, it can be pulled back into the opposite groove without any great difficulty. A wide groove is also helpful to

the setter. Fig. 6 illustrates the usual method of setting glass into a metal sash of a commercial type. In the place of a stop bead, as used in an ordinary wood sash, small metal clips are screwed into the sash to hold the glass firmly in place.

This concludes a brief description of the many interesting processes necessary to the making and installing of a stained glass window. As has already been said, the art of the glass worker has never been forgotten, but ages of neglect of its best practice resulted in debasement from which the art has been long in recovering. Today its principles are once more understood and practiced, and stimulated by the encouragement which has followed the revival of interest in everything connected with church architecture, the art of stained glass has resumed its place high in the company of the arts which serve as the handmaids of religion. It will without doubt achieve triumphs as notable as any in its past.

# The Architect and the Building Committee

By GEORGE E. MERRILL

*Architect-Secretary, Department of Architecture, The American Baptist Home Mission Society*

NEVER again!" Such is the sentiment all too frequently expressed with vigor by architects who have sacrificially endeavored to serve a church, only to have their efforts misunderstood and to find themselves blamed for a lack of results not at all the fault of the architect. Fortunately such experiences are not universally met with, or the situation would be tragic, but differences between churches and architects do arise, and seemingly more frequently than in other lines of building work. Can these misunderstandings be avoided and a happy handling result? From a study of hundreds of church building projects, we know that this *can* be done, and, where the proper steps are taken, that this is *being* done. The purpose of this article is to make clear the way. Permit the writer to say that he has functioned happily both as chairman of a building committee, having to select and deal with the architect, and, in other instances, as the architect himself, having to deal with a church building committee.

The same committee member and the same architect, having cordial relations all through the erection of a commercial structure, may have serious differences ere a church is built. The owner of the commercial building, thoroughly informed in his own particular line by searching analysis and by visiting in his travels other buildings similar in character, knows what he wishes and can make the matter clear to his architect. No lack of understanding exists. The architect, skilled in commercial building work, knows how to interpret the owner's wishes, and a satisfactory handling results. A church committeeman visits but rarely other churches outside of his own home city; furthermore, he understands but little of his own church aside from his own individual line of activity. He is generally unaware that in the past few years the requirements of the church in its building arrangements have undergone a revolutionary change. Attempt to discuss with him a five-fold program, or as to whether six or eight departments shall be provided for the church school, and he will not understand what is meant. If by some fortunate circumstance he does have some understanding of such matters, commensurate with his knowledge as to his commercial building needs, he may have an architect for the church who does not understand, and so the committeeman, usurping the architect's prerogative, directs that this and that be done to revise the plans submitted. The net result is a church structure highly unsatisfactory for use, and "the architect is to blame." The lack of understanding is frequently as chargeable to the architect as to the committeeman.

In accomplishing a desired satisfactory building result, the work of the committee and the work of

the architect are distinctly different, because they deal in entirely different realms. It is the duty of the committee to furnish the program of daily activities and determine the capacity requirements, and that of the architect to not only provide the requirements but to so plan the building as to ideally house the activities.

Let us suggest one method of procedure which, when consistently employed, operates to produce a happy building. The initial step is for the church to officially choose a general committee, not limited to the official board, but including the pastor or rector and as many active members as are desired, who are representative of each of the boards and organizations within the church, the younger people as well as the older, and of both sexes. This committee may well consist of as many as 20 members, for it is charged with responsibility along four distinct lines of procedure. This committee should be authorized to incur such initial expense as may be necessary to discover the church's building needs. When this general committee organizes, it will appoint from its own committee members four sub-committees, of say five members each, (1) on program and requirements, (2) on architect and building, (3) on ways and means, and (4) on publicity and collections. While each sub-committee will at once begin to study its own duties, and gather data to that end, the sub-committee on program and requirements will be the first to actively function. Of this committee the pastor or rector should certainly be a member; indeed he may well be an ex-officio member of all sub-committees.

The program and requirements committee should begin its deliberations by engaging a thoroughly informed church architectural adviser at a fixed fee; it should analyze the community to be served; study the church membership and its constituency; discover wherein the church has failed to function and why; judge as to how best to develop new contacts; weigh possibilities for new activities; determine what facilities are to be provided or space to be allotted for the activities, both old and new; decide as to the relative importance of the several needs; fix upon a site and set the financial goal to be attained. This sub-committee on program and requirements should report its findings to the general committee with sketch plan studies illustrative of its recommendations, and, when approved by the general committee, this report should be submitted by the general committee to the church for its adoption and for authority to commission a practicing architect and proceed with the work. A printed ballot mailed to each member of the parish with a line for his signature and a space for voting "yes" or "no" has been used with great success for reasons at once apparent. It is



vital that each member of the church at this point shall have had an opportunity of having his full say. This shuts out later fault finding, and commits the entire parish to the procedure.

While the sub-committee on program and requirements has been at work, the sub-committee on architect and building will have been making investigations; the sub-committee on ways and means will have been canvassing in a general way the financial resources of the church for its building project; the sub-committee on publicity and collections will be gathering preliminary data. All being members of the general committee, they will be fully informed through conferences with the sub-committee on program and requirements, so that, immediately the church has authorized the general committee to proceed with the building, these other sub-committees will be ready to function.

The general committee, now authorized by the church's membership to proceed along definite lines, engages an architect for the building. The sub-committee on architect and building will recommend, and the general committee will act. The building committee will appoint *one* of its number to have all dealings, preferably in writing, with the architect. Changes, that chief element causing exasperation and added cost to architects, are now avoided. The time for backing and filling is past, the program is set, and the requirements are established, so that the architect, furnished with this data, may proceed to develop his drawings and other documents which, when approved by the general committee, are sent to contractors for offers, and contracts for the building are let on the sanction of the general committee.

The sub-committee on ways and means will not encounter adverse criticism, since by vote each member of the church has committed himself with regard to the project. There can be no complaint of "taxation without representation." The canvass for subscriptions having been completed, the sub-committee on ways and means may cease to function, but often it remains active, seeking to enlist newcomers in the building enterprise; in any event, its members remain active on the general committee. The sub-committee on publicity and collections will work "hand in glove" with that on ways and means. One need not go into detail as to methods, except to say that an illustrated booklet of the proposed building, giving full explanations, is one of the most helpful aids which this sub-committee can render the sub-committee on ways and means. Collections on subscriptions usually outrun the completion of the building, so that this sub-committee generally functions even beyond the life of the general committee.

A few comments about the architectural adviser during the preliminary work of the sub-committee on program and requirements may be helpful. The choice of the architectural adviser is a crucial step. The man selected must not only be competent architecturally but he must have an intimate first-hand knowledge of the inner workings of a modern church

program in all of its parts, and be qualified to point out to the sub-committee on program and requirements wherein their proposed program is unbalanced or behind the times. He will furnish a comprehensive questionnaire, such as is suggested upon page 163, to the committee to assist it in making its entire analysis. He is charged with the responsibility of pointing out to this sub-committee what other churches similarly situated are doing, and leaving the decision to the committee. He will advise upon the matter of site, and furnish an illustrative sketch plan showing how the desired program may function, how the capacity requirements for each activity be obtained, and how all portions of the proposed structure may be properly coordinated. To this end seven religious denominations have now organized bureaus or departments of architecture which specialize in furnishing the consultation and advice just referred to. These advisers do not supplant the practicing architect, but devote their entire attention to an analytical study of the constantly growing needs of the church in its five-fold activities. With the denominational contacts back of these church advisers, with their constant and intimate association with religious educational and other specialists, there is now wealth of data available for both the churches and the architects, not previously obtainable.

One of the many benefits resulting from the united efforts of these advisers is their insistence, to the churches served, that worthy architects be employed, namely those thoroughly qualified by education, experience, ability and character. By this emphasis churches are coming to realize that satisfactory church buildings do not just "happen"; that the final result is fixed from the start by the ability of the architect chosen; that the church should insist upon paying the full architectural fee and thus avoid finding itself under obligation to its architect because he has made a donation.

The architect's dealings, being conducted as already said, with one individual, instead of his having to hold innumerable conferences with a large committee, and the architect being given a signed statement as to program and a written report as to requirements, together with an outline of an especially studied solution to illustrate the particular project in hand, he finds himself, at the start, fully informed as to the church's wishes, expressed in unmistakable terms.

We have, then, a comparatively new situation in church building work, brought about by a recognition of the fact that, a new day having dawned in church building requirements, special study by experts employed for the purpose is necessary to discover the exact nature of the new and changing needs and to make these clear to the architectural profession. It is recognized that, just as no church can carry out satisfactorily a given program without proper facilities, so also as has been said, "the very character of a church is determined by the plan, arrangements and the appearance of its buildings"; an astounding statement, but true.



REPORT OF CONDITIONS COVERING BUILDING PROJECT FOR:—

Name of Church.....City..... State.....  
 Reported by.....Pastor..... Layman.....  
 Street Address.....Date.....

Answer FULLY using separate sheet if necessary.

CHURCH

Seating Capacity Desired?.....  
 Membership?..... Average Attendance?.....Percentage of Membership Increase in last 5 years?.....%  
 Use of Building for other than regular services?.....

SUNDAY SCHOOL	Ages.	Enrollment.	(Do not include Home Dept.)	Ages.	Enrollment.
Cradle Roll	1-3 yrs.	.....	Intermediates	12-14 yrs.	.....
Beginners	4-5 yrs.	.....	Seniors	15-17 yrs.	.....
Primary	6-8 yrs.	.....	Young People	18-24 yrs.	.....
Juniors	9-11 yrs.	.....	Adults	25 yrs. up.	.....
Average attendance of entire school.....			Growth of School to be provided for.....%		

COMMUNITY

Population (1 mile radius)?.....Estimated Growth?.....  
 Character and Principal Industries?.....

Locality of Proposed Building:

High Grade Residence..... Suburb (distance from center of city).....  
 Cheaper Residence..... Downtown District.....  
 Apartment House District..... Factory District.....  
 College Center..... Foreign District (give nationality).....  
 Distance from nearest church building of the same denomination? .....

Public Institutions for Community Welfare?.....

What is largest meeting place?..... Seating capacity.....  
 Recreation Centers available?..... Gymnasium needed?..... If so, why and size?.....  
 Community attractions tending to draw from the church? .....

PROGRAM OF CHURCH'S WORK. (Describe in full, giving list of all Sunday and week day activities to be carried on in the church buildings):

BUILDING DESIRED. Describe present situation, reasons for building, and just what building is wanted, and whether new, alteration or addition. If sexton's living quarters are to be provided, give facts. Use separate sheet and answer in detail.....

Say from what direction is major approach to site and why .....

CHOIR. Accommodation, Kind.....For how many? ..... Where?.....

ORGAN. Probable cost? \$.....Describe organ.....

ARCHITECTURE. Name any decided preference as to architectural style?..... of { Stone  
Brick  
Wood }.....

ARCHITECT. Have you engaged your architect?.....If so, give name and address.....

FINANCES

Best Property in Community (price front foot)?..... Your Lot (price front foot)?.....  
 Cost of Building? (Do not include furnishings) 1st Unit \$..... 2nd Unit \$..... Total \$.....  
 Is congregation financially able to build adequately?.. ..

# What Church Architecture Means to the Minister

By REV. LOUIS C. CORNISH

**D**OES your church edifice help or hinder the life of your parish? Is your church plant,—church, parish house and parsonage,—an asset or a liability? Does it lift, or is it a load to be carried? Does it create enthusiasm or depression? Do people love and venerate it, or do they merely tolerate or even dislike it?

Ask the ministers in all parts of the country these questions, as I have done for some years, and their answers will reveal in good measure what church architecture means to them. Furthermore, the answers can be summarized fairly well, there being always a *something plus* at the end of the category. All will agree on strategic location, adequacy of buildings for their purposes, dignity, and it may be—beauty. These are the obvious requisites and tend to follow the sequence here given them. Beyond them lie considerations less easily listed, but of primary importance. Aside from location, size, type or cost, to satisfy the intelligent minister the church must be “worshipful.” If it is to be an asset, the church must be itself a symbol, even an embodiment, of its high purpose, and must express to the worshippers harmony and a sense of the eternal mysteries.

Failure to attain these values is frequently due, and every architect knows it well, to the ignorance of committees and sometimes of ministers, who refuse good advice and insist upon following their own poor judgment; and it is due also, and many able architects fail to realize this, to the vagaries of architects who care little for religion and are profoundly ignorant of what a church attempts to achieve. “What would you do with it if it were yours?” asked a noted preacher of a well known leader to whom he had shown a great pile of brown stone and red tiled roof and tower, erected by an architect of high repute but uninterested in churches. The reply was, “Tear it down and let a religious architect rebuild it.”

The lack of religious embodiment in church building finds plentiful illustration, often of amazing crudity. Imagine, for example, a church, parish house and parsonage to be erected on a strategic corner lot in a large city. The plan showed the parish house apparently in violent collision with the church. The “church auditorium” was square. One wall was broken by a high proscenium arch, filled by a split and roll wooden curtain which shut off the stage. The pulpit stood shyly in a corner. Theater chairs, arranged on pivots, turned either toward pulpit or stage. Yet the designer had been trained in schools of good repute. What could such an

arrangement mean to a minister, in conducting worship, except humiliation and handicap? Unfortunately, this is not an exaggeration. Buildings of similar crudity are familiar throughout the country.

By way of contrast, take what is perhaps the most elaborate attempt in late years at religious symbolism. One enters the Memorial Church at Fairhaven, Massachusetts, through a deep porch, above which rises a stone cross of delicate design. It does not command; it gently challenges. The meaning is clear: only through the shadow of the cross, by self-sacrifice, do men enter the religious life. Great bronze doors open into the porch. Around the panels in decorative niches are figures of the saints, ancient and modern; the fellowship of the saints welcomes you to its high comradeship. In the marble pavement, suggesting but not insisting, are inlaid the signs of the zodiac, the ancient symbols of the outermost realms of space; he who lays hold on religion gains truth that is universal, as true in distant constellations as on this planet. In the beautiful stone baptistry beneath the high tower stands a noble font. Over it hangs a tabernacle or canopy made of olive wood brought from the Mount of Olives, enshrining a multitude of tiny figures of the saints, skillfully carved at Oberammergau; the striving of the saints through the centuries blesses the baptism. At the chancel end of the church rises a glorious window, the “Adoration,” typifying the leadership of Jesus and the mystery and divine possibility of life for all the children of men. One may visit this shrine times without number and always find some fresh and delicate religious suggestion through the symbols of truths that are old and yet forever new. Costing sums estimated at millions of dollars, obviously this is a unique edifice. Many would not wish its elaboration of beauty, even if free to choose it; but the essential values here embodied in a multitude of details can be expressed in far simpler form.

“The quest for an auditorium” might well describe much church building during the latter half of the past century. “The quest for a church” has built many modest but lovely structures. Most of our eighteenth century churches bear witness. Those built in the earlier part of the nineteenth century also testify. Those of the latter half of the past century, however, disclose a confusion of quests. More recently there has been a marked and encouraging increase in the reverent quests for the church. To the minister, the architecture of his church is of supreme importance. It means a blessing or a curse upon his efforts to serve both God and man.

# Architectural Requirements of the Episcopal Church

By REV. DR. HUGH BIRCKHEAD

*Rector of Emmanuel Church, Baltimore*

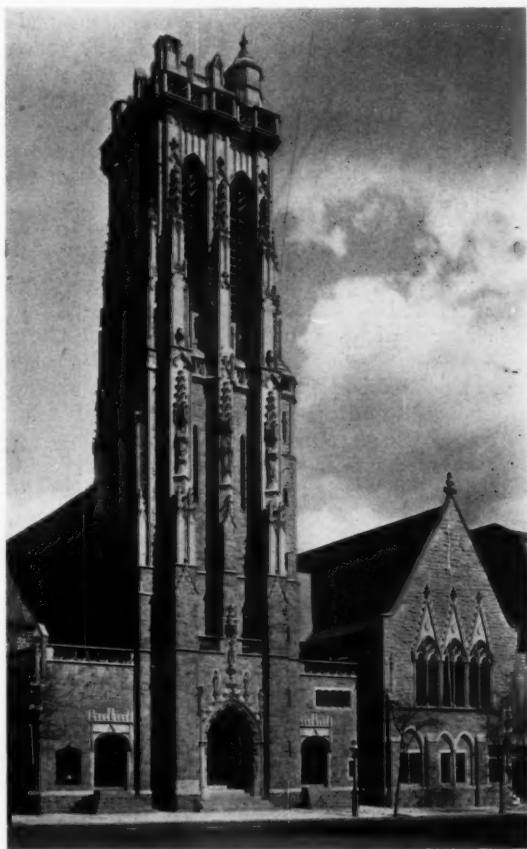
THE condition of ecclesiastical architecture in America represents adequately the present vagueness in regard to the requirements for a building to be used for the purposes of worship. It is lamentable that belief and prejudice, as well as reaction, have so greatly interfered with architectural form. A great many churches symbolize a strong grudge or a permanent fear of the beautiful, which was one of the definite results of the Reformation, and yet with the gradual growth of a broader culture and greater discrimination in American life we desire, and are willing to pay for, more comely places of worship; but these must still preserve certain marks of sectarian difference, and hence the average architect, having in mind the consistent beauty of the churches and cathedrals of the old world, is thwarted by a constant compromise between what should be and what must be. One of the problems which face him at the start is the effort to put into a building which is primarily an auditorium in most cases the lines and feeling of a sanctuary.

The Episcopal Church is the most inclusive group among the 202 religious bodies into which Christianity in America is divided. Its worship varies from the rigorous simplicity of a Protestant service to the elaborateness and sensuous appeal of the Church of Rome. It is thus impossible to describe any one building as possessing all the attributes and requirements for every congregation. In New York, for instance, there are three outstanding examples of modern church architecture, all of them satisfactory to the congregations that make use of them, and yet quite different in treatment, conception and atmosphere. St. Bartholomew's, designed by Bertram Grosvenor Goodhue, is a well adapted Byzantine structure in which the salient requirement was an auditorium in which

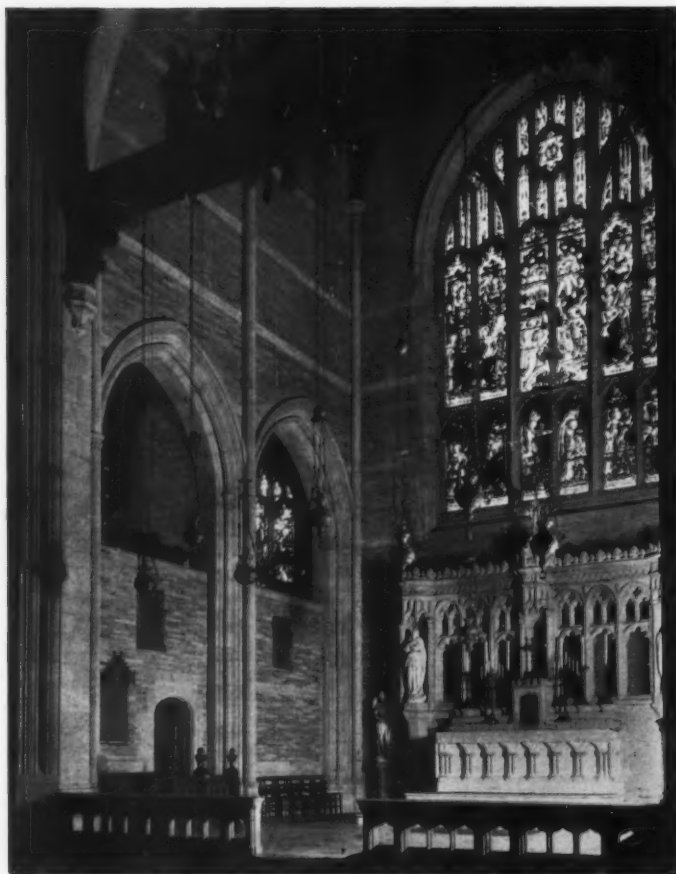
every word can be heard by every worshiper, no matter where he happens to sit. It is severe in its simplicity of outline and beautiful in its detail. Such a building was originally planned by the age that produced it for a service magnificent in color, elaborate in ritual, and with a strong emphasis on the mystical side of religion. St. Thomas', designed by Cram, Goodhue & Ferguson, frankly suggests the Gothic churches of western Europe and England, prior to the Reformation. Here again the lack of color which the service itself was supposed to give is conspicuous, and the auditorium is strongly emphasized. The Church of St. Mary the Virgin, designed by Le Brun, on the other hand, which derives its inspiration from the French Gothic, has a very elaborate and colorful service, with an orchestra, two choirs, many lights, and clouds of incense, and the spoken word is subordinate in the mind of the congregation to the ornate service.

In the old days the architect was not only a churchman but was also usually a priest or a member of a monastic order.

The building he created was an adequate setting for the ritual which he knew and loved. There was not the present divorce between a borrowed background, coming from the centuries when beauty was frankly considered as truly an attribute of God as goodness and truth, and a service which is clad usually in black and white, and is too often a setting for the personality of a preacher. We are perfectly willing to have an elaborate setting provided that it meets our dogmatic differences, especially from the Church of Rome; but the minister and his attendants and the choir must not be expected to conform to the requirements of a building which comes down to us from the days when all the men in the congregation dressed in brilliant colors and when it was quite natural that



"Christmas Tower," Emmanuel Church, Baltimore  
Woldemar H. Ritter, Architect



Sanctuary, St. Ignatius' Church, New York  
Choristers placed in gallery at one side  
Charles C. Haight, Architect

the clergy should have their sacred liveries, as the servants of God, equally splendid and in shades representing the Church's seasons of joy or penitence.

The best that has yet been attained follows the lines of Gothic architecture, usually stripped of the element of mystery, and so arranged that everything may be seen at a glance and that the words of the preacher may reach the farthest listener in the auditorium. As a result of these conditions, Gothic architecture has suffered more than any other type; because the rector and vestry do not hesitate to insist upon their own ideas, and because their knowledge of architecture and interest in correctness have yet to be educated into being. Our modern efficiency in lighting is perhaps the greatest enemy to the functions of a church as a place of prayer and meditation. The "dim religious light," which has so much to do with the sacredness of old world churches, has disappeared. It is true that this is also due to the fact that a congregation is expected to read and no longer follows the service from memory or repeats prayers that have been familiar since childhood. The average Protestant

church is practically never used for worship between services, and when the congregation is assembled on Sundays, it depends upon the way in which it is led from the chancel, and waits through the processes of a service for the moment when the preacher ascends the pulpit and claims its interest by the force of his mind and personality. What we need, in these days, is a conference of clergy, psychologists, artists and architects to discuss the whole matter of public worship. The beautiful must be given its place once more as a part of the personality of God Himself, and a compromise must be made between the necessity of making the printed page visible and the darkness which in all times has helped to bring God nearer to His kneeling children.

Another misconception which has grown into a custom is the placing of the choir between the congregation and the sanctuary. This was originally done by the monastic orders, as the choir consisted of their own members and occupied a position between the altar and the people. In the cathedrals the choir is a smaller church, used for daily services. There is no excuse for this in an ordinary parish, and it would be a good idea if architects would suggest to congregations that the singers be placed somewhere adjoining the chancel so that they will not arrest the eyes of those

in the pews as they look toward the sanctuary.

In closing I wish to make a definite plea to architects, asking them to study carefully the conditions of worship as embodied in form and color; to show more energy in dealing with clergymen and building committees, usually prejudiced and grossly ignorant; and to help us to evolve the American church as something which is beautiful and makes possible the desire for the mystical element in religion as well as the sermon. They must bear in mind that most of us do not know what we want and are waiting to be led with authority, and that after our prejudices have been overcome we are grateful to the wisdom and firmness that have made us choose a better way and given us those things which we had neither the vision nor the experience to know were necessary in a place of prayer. I would also emphasize the fact that the architect who has no religious feelings himself can rarely accomplish "the beauty of holiness" as an academic problem. Let us hope for more men who will make it the mission of their lives to clothe in color and form the unquenchable longing of the average American for a real sense of the nearness of God.



## Acoustics of Church Auditoriums

By F. R. WATSON

*University of Illinois*

THE attention of architects is being more and more directed to the question of the acoustics of large audience rooms. The disquieting knowledge of the defective acoustics that exist in many completed halls and the outspoken protests of the auditors create a demand for reliable information by which such defects may be avoided in building new auditoriums. With many architects, however, there is the desire not so much to avoid the defects, as to secure the really desirable feature of acoustic excellence whereby speaking is easily understood and music is rendered under conditions that enhance its delight.

In former years, because of the lack of suitable guidance, the nature of the acoustics was to a great extent a matter of chance, with the result that architects considered it hopeless to attempt to secure acoustic results with certainty. It was also generally believed that the best method of correcting faulty acoustic properties was by stretching wires or installing sounding boards. At the present time, due largely to the painstaking investigations of the late Professor Wallace C. Sabine, the knowledge of the subject has grown to such an extent that audi-

toriums may be designed with certainty of having satisfactory acoustics, and defective auditoriums are corrected with confidence—but not by using wires and sounding boards, which are shown to have but little effect.

Perfect acoustic conditions in an auditorium are obtained when an average sound rises to a suitable intensity in every part of the room, with no echoes or other distortions of the original sound, and then dies out quickly, so as not to interfere with succeeding sounds. To secure these ideal conditions it is necessary to incorporate three important features in the architectural design. In the first place, the volume of the room should be proportioned to the source of sound so as to insure a suitable loudness; that is, so that each cubic foot of space will be filled with the right amount of energy to comfortably excite the sensation of hearing. Instrumental music, particularly from brass instruments, thus requires a larger volume for distribution of its energy than speaking. The second factor necessary for good acoustics involves a consideration of the positions, sizes and shapes of the walls. These should be arranged so as to avoid the possibility of there



Church of the Sacred Heart, Washington  
Murphy & Olmsted, Architects; Maginnis & Walsh, Associate Architects

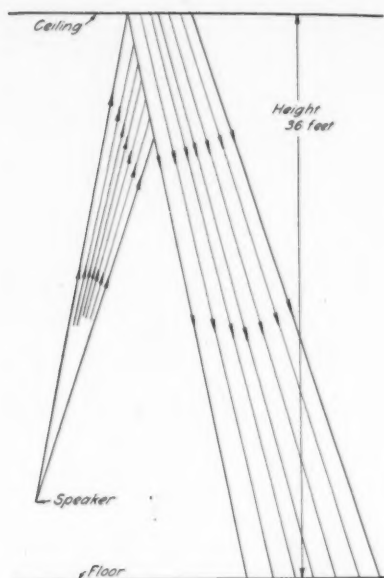


Fig. 1. Reflection of sound from flat ceiling. No defect

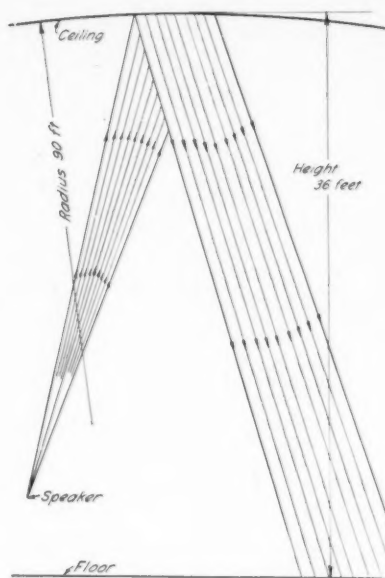


Fig. 2. Radius of curvature more than twice ceiling height

being echoes and other distortions. After the volume and shape of the room are decided, the third and most important item to consider is the character of the interior surfaces, to make sure that the correct amount of sound absorbent will be present to damp out the residual sound or, technically speaking, to reduce the reverberation.

Suppose these general ideas are applied to the particular case of church auditoriums. The sources of sound are three: speaking, vocal music, and instrumental music, usually a pipe organ. A question immediately arises about the volume or cubage of the room, because music is more intense than speaking and requires a larger volume for best effect. The obvious solution will be to compromise on an intermediate size which will be satisfactory unless the music is extremely loud or the speaker's voice is weak. Except for cathedrals, the decision about volume depends also on the probable size of the congregation or audience, and here the further question arises as to how large an auditorium may be and still have acceptable acoustics. Not enough experiments have been made as yet to answer this question with satisfaction, but the

writer cites the case of the Eastman Theater, in Rochester, which has a volume of 790,000 cubic feet, accommodates 3,340 auditors, and is considered satisfactory for pipe organ music and also for speaking.

The effect of the walls of an auditorium in regard to position and shape is readily understood by a geometrical study of the main sections of the room. Sound rays are drawn from the position of the speaker to the various surfaces where reflection takes place. Curved walls, arches and domes concentrate the reflected sound and are quite likely to produce trouble. This does not mean that rooms

must always be rectangular for best acoustic effects, but that curved surfaces must be specially designed and placed so as to avoid causing defects. For instance, ceiling surfaces may be curved provided the radius of curvature is either more than twice, or less than half, the ceiling height. Figs. 1 to 4 represent the reflection of sound from various types of ceiling surfaces and show that satisfactory effects are obtained except when the radius of curvature is nearly equal to the ceiling height.

Curved side walls are more likely to produce trouble than curved ceilings, because they are nearer

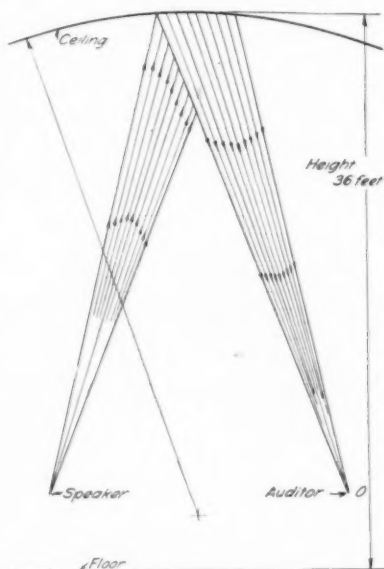


Fig. 3. Radius of curvature nearly equals ceiling height. Marked echo

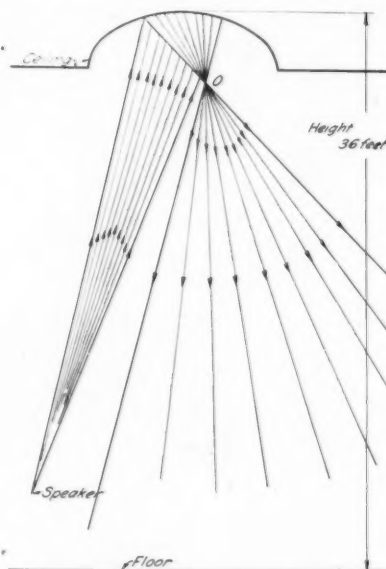


Fig. 4. Radius less than half ceiling height. No marked defect

the auditors. This is understood by referring again to Fig. 4 and imagining that the curved surface is now a side wall. Auditors in the position at O will get an undue concentration of sound. Similarly in Fig. 2, with a speaker at some distance from the wall, the sound will be focused for some auditors. If it is desired to make the general shape of a room circular, the side walls may be made the plane sides of an octagon or some other geometrical figure rather than keep them circular.

Sometimes echoes are set up by two or more reflections from walls. Fig. 5 illustrates such a case where sound from the speaker is focused by a side wall of double curvature and then spreads out only to be focused again by a second curved wall that produces an echo.

The third important feature in acoustic design concerns the amount of sound absorbent needed for good results. The lack of proper adjustment of this feature is the most common cause of defective acoustics. After a sound has made its impression on the auditors, it should die out rapidly enough to leave the field free for succeeding sounds, a condition that requires the presence in the room of a calculated amount of absorbing material.

Consider now the application of these three essential factors to the acoustic correction of an actual church auditorium of 242,000 cubic feet volume and seating capacity of 700.\* The volume is such that the room will be satisfactory for usual speaking and music, but the sound of a brass band will be overpowering in its loudness, and a weak-voiced speaker can be heard only with difficulty. The ceiling walls, shown in Fig. 6, are curved with the radius almost

\*See book on "Acoustics of Buildings," in which calculations are given in detail for a number of auditoriums.

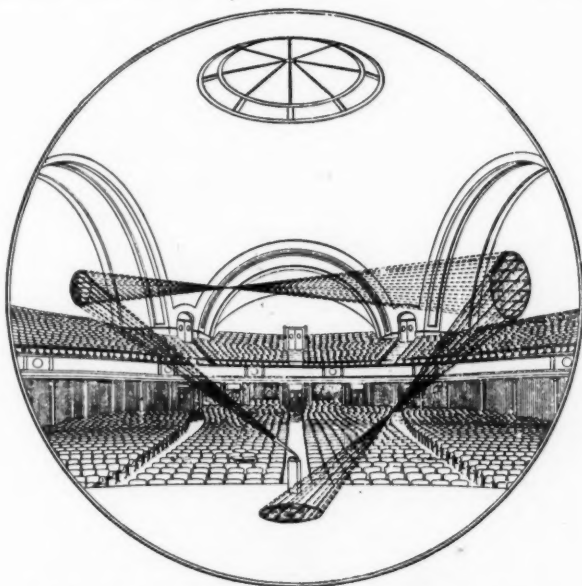


Fig. 5. Two reflections from curved walls, resulting in strong echo

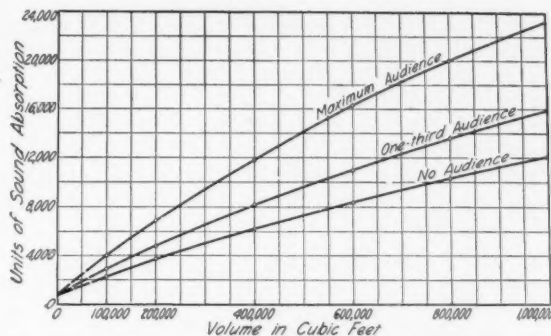


Fig. 7. Showing sound-absorbing material needed for a particular volume

equal to the ceiling height. Sound proceeding from the speaker to one of these walls is reflected, brought to a line focus, and then spreads out so as to cover an elliptical area of the floor. Sound striking farther back on this wall is reflected to the rear wall and from there back to the floor. Both of these echoes were quite marked. The other surfaces in the room were plane and produced no particular trouble which interfered with the acoustics.

The amount of sound-absorbing material needed was calculated by means of a formula and table of absorbing coefficients. The calculations are not repeated here, but a more direct solution is given by means of a curve, Fig. 7, which gives the amount of absorbing material needed for auditoriums of different volumes. The data for this curve have been collected for a number of years by the writer from auditoriums with satisfactory acoustics. For the volume in question, 5,500 units of material are needed when one-third of the capacity audience is present. Data concerning the absorbing material in

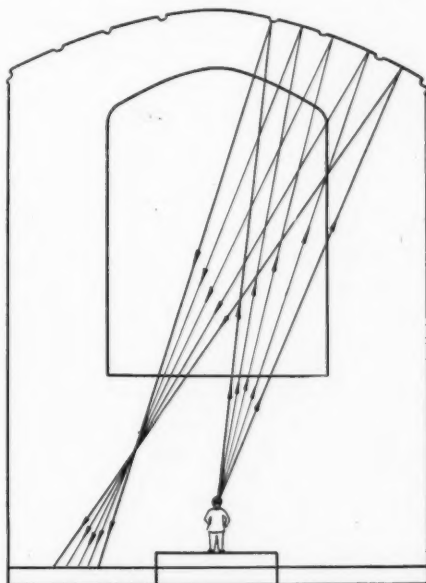


Fig. 6. Reflection of sound from a church auditorium ceiling. Echo formed

the room are given in the tabulation included here.\* It is seen that with the one-third audience, only 1,974 units are available and that there must be added the difference between this number and 5,500 units to give the desired effect.

It remained to decide the kind of material and best positions for installation. After a study of the problem it was recommended:

1. That hair felt, 2 inches thick, be placed in the ceiling coffers. This served to absorb sound and to assist in breaking up echoes. Sound waves on striking the felt are partly absorbed and changed in phase on reflection compared with the waves reflected from the surrounding woodwork, thus producing interference which influences the acoustics.

2. Either that cushions be placed in the seats or that a carpet be laid on the floor.

3. That a number of curtains or tapestries be hung in front of the stone side walls.

The installation of materials as recommended would serve to reduce the echoes and to give an acceptable time of reverberation. A word or two might be added about materials for acoustic treatment. There appears to be a satisfactory movement at the present time to produce suitable products, and there are now available or in the process of development several different articles. Absorption may also be arranged by installing grilles in the surfaces of an auditorium through which sound may pass. These grilles eliminate reflection and reduce echoes in critical cases, but they should be backed by spaces containing absorbing material.

Consider now certain types of church auditoriums that have special features. Take the case of a cathedral. The size of the cathedral nave is usually so great that the voice of an ordinary speaker is practically lost, and the resultant sound is not loud enough for easy hearing. Music, on the other hand, is more satisfactory because of its greater energy. The ceiling areas are likely to be curved, but they are usually so high above the floor that the concentration of sound will not affect the hearers. It is quite likely, though, that echoes will be set up by more than one reflection of sound, so that a special geometrical study of the walls should be made to anticipate any marked defects. The plan of the area, usually in the form of a cross, limits the possibilities for locating a speaker and congregation for convenient hearing. An elevated pulpit and a sounding board of suitable shape may aid the speaker to some extent by reflecting his speech as directly and effectively as possible to the auditors,

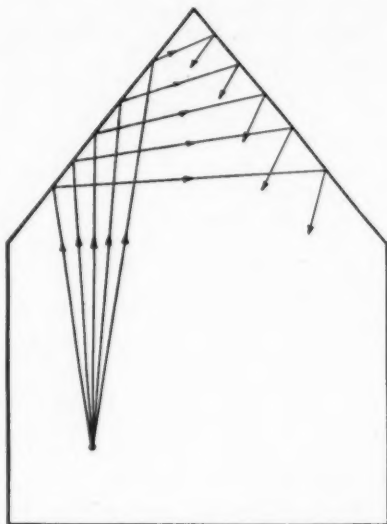


Fig. 8. Diagram of Gothic ceiling showing double absorption. Small chance for echoes

but the conditions are not nearly as advantageous as in a smaller interior with a controlled shape.

Christian Science churches furnish a particular form of auditorium which is usually circular in horizontal cross-section, with a dome. Speaking takes place not only from the platform but also by members of the congregation from any point on the floor. This produces conditions very likely to form echoes, because the curved side walls and the dome concentrate the reflected sounds. An effective safeguard would be to use a flattened dome surface with the radius of curvature more than twice the ceiling height. The curved effect is thus maintained and may be

accentuated by circular rows of coffers. The focusing effect of the side walls may be reduced either by hanging curtains in front of them or by making them plane surfaces which will be sections of a hexagon or other regular figure. Part of the absorbing materials needed to reduce the reverberation should be placed on the ceiling surface. Other details of arrangement would be decided after a study of the auditorium in question.

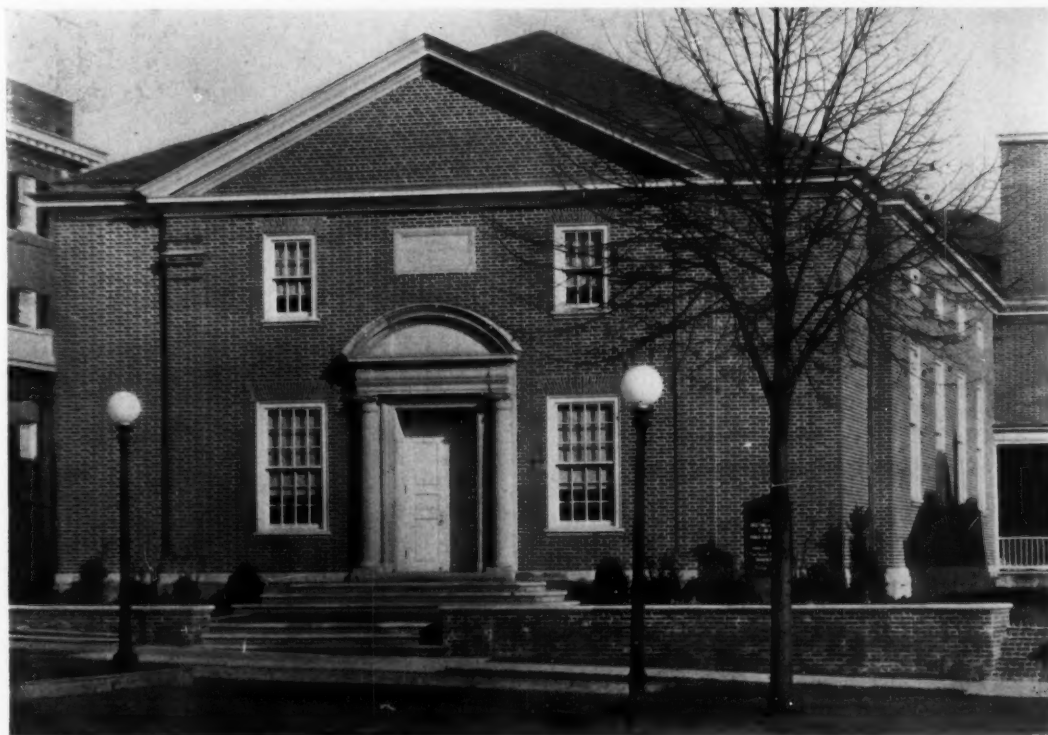
Gothic ceilings usually produce good acoustic effects. Sound carries easily from the pulpit to the rear of the church. Installing absorbing material on the ceiling surfaces reduces possibilities of echoes and acts as an effective absorbent. See Fig. 8. Street noises are sometimes objectionable, and these may be avoided to some extent by means of an entrance lobby quieted by absorbing material. Outside disturbances are then prevented from reaching the auditors, first by the outside doors, then by the quiet lobby, and finally by the swinging doors to the auditorium. Upholstered seats or pew cushions have the advantage that they make the space partly independent of the congregation. Auditors absorb much sound because of the clothing worn. On occupying seats, they substitute the absorption of their clothing for that of the cushions or upholstery, and thus tend to keep the absorption of sound constant. Music or speaking in such a room is much the same whether a congregation is present or not.

Material	Area	Coefficient	Total Units
Cork floor	4560 sq. ft.	× .03	= 137.
Stone walls	9360 " "	× .019	= 178.
Glass windows	4465 " "	× .025	= 112.
Woodwork	5679 " "	× .061	= 346.
Plaster	2057 " "	× .025	= 51.
Seats	700 " "	× .1	= 70.
a = total units, empty auditorium 894.			
235 auditors ( 1/3 audience) × 4.6 = 1080 + 894 = 1974			
700 auditors (max. audience) × 4.6 = 3220 + 894 = 4114			

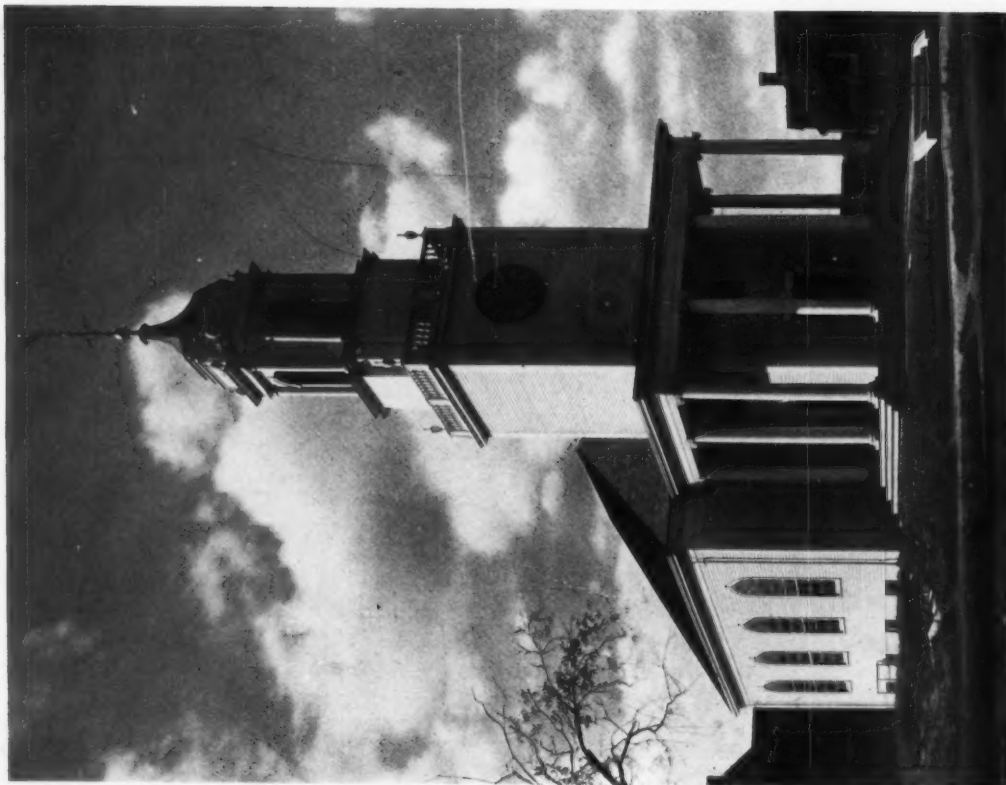




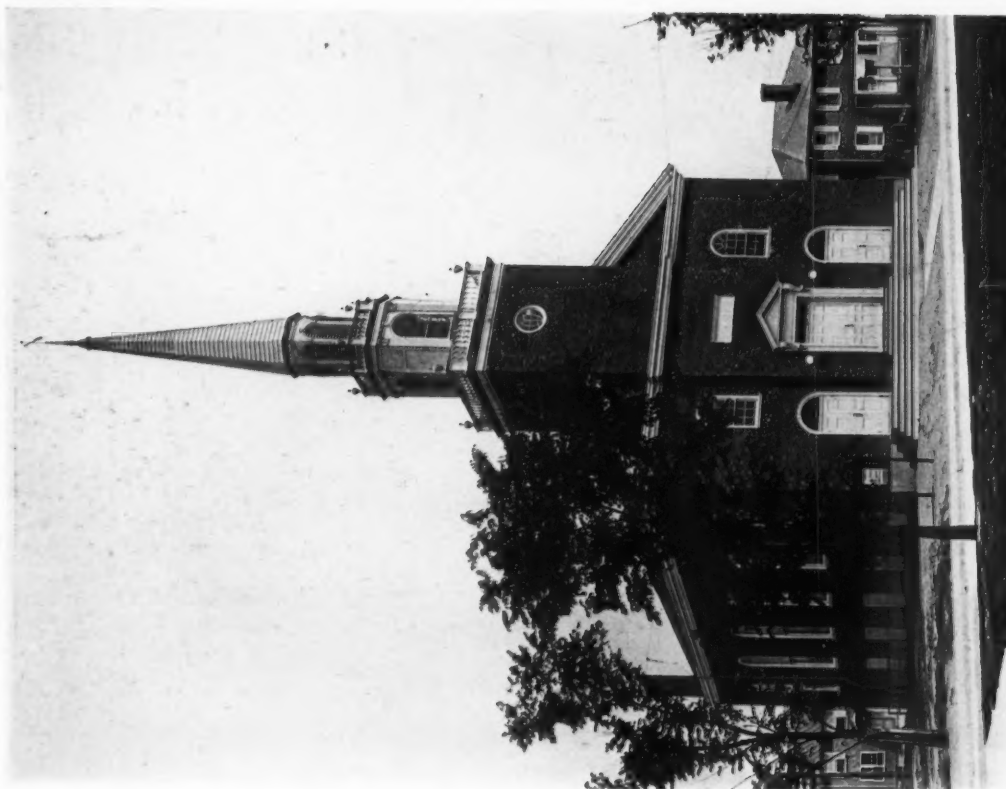
FIRST M. E. CHURCH, WESTFIELD, N. J.  
J. F. JACKSON, ARCHITECT



FRIENDS' MEETING HOUSE, BALTIMORE  
EDWARD L. PALMER, JR., ARCHITECT



CALVARY M. E. CHURCH, ARLINGTON, MASS.  
JAMES H. MAC NAUGHTON, ARCHITECT



BAPTIST CHURCH, YORKSHIP VILLAGE, N. J.  
ELECTUS D. LITCHFIELD & ROGERS, ARCHITECTS



ST. MARK'S CHURCH, RICHMOND, VA.  
BASKERVILLE & LAMBERT, ARCHITECTS

*Photos. Tebbs*

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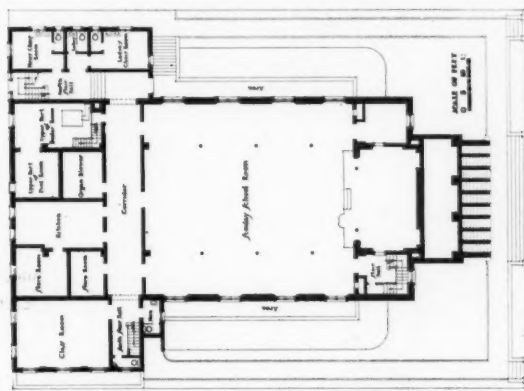


PLANNING of this church was done in the spirit of the later and more luxurious of the Colonial churches, a number of which still exist in the older cities of the Atlantic seaboard.

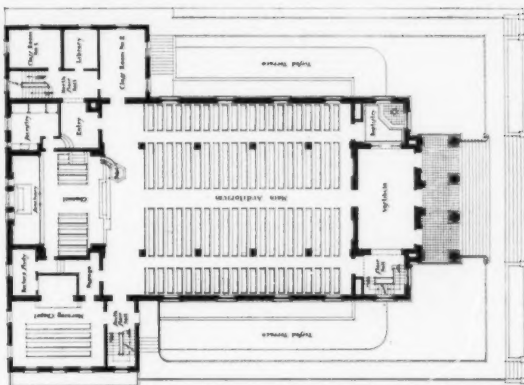
The plan is similar to that of several of the earlier churches,—nave divided from aisles by columns which support the ceiling, flat over the aisles and barrel vaulted over the nave. Detail of the interior is somewhat richer than that used without and is of wood, painted excepting for such details as the pews and the handrail to the pulpit which are mahogany in natural finish. As is correct in a church of this type the windows are filled not with stained or painted glass but with glass which is clear or transparent and in fairly small panes. The Colonial character of the interior is considerably heightened by the use of a Palladian window above the altar and of a suspended sounding-board over the pulpit. Here the Sunday School department is in a well lighted basement, with some of the classrooms on the main floor.



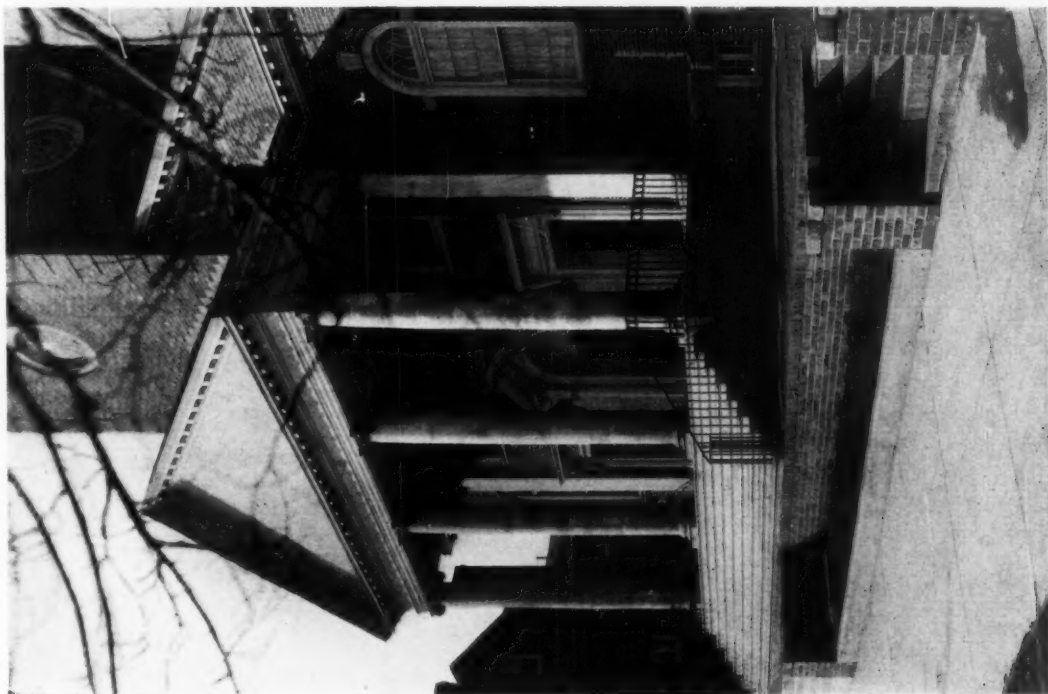
SECOND FLOOR PLAN



BASEMENT PLAN



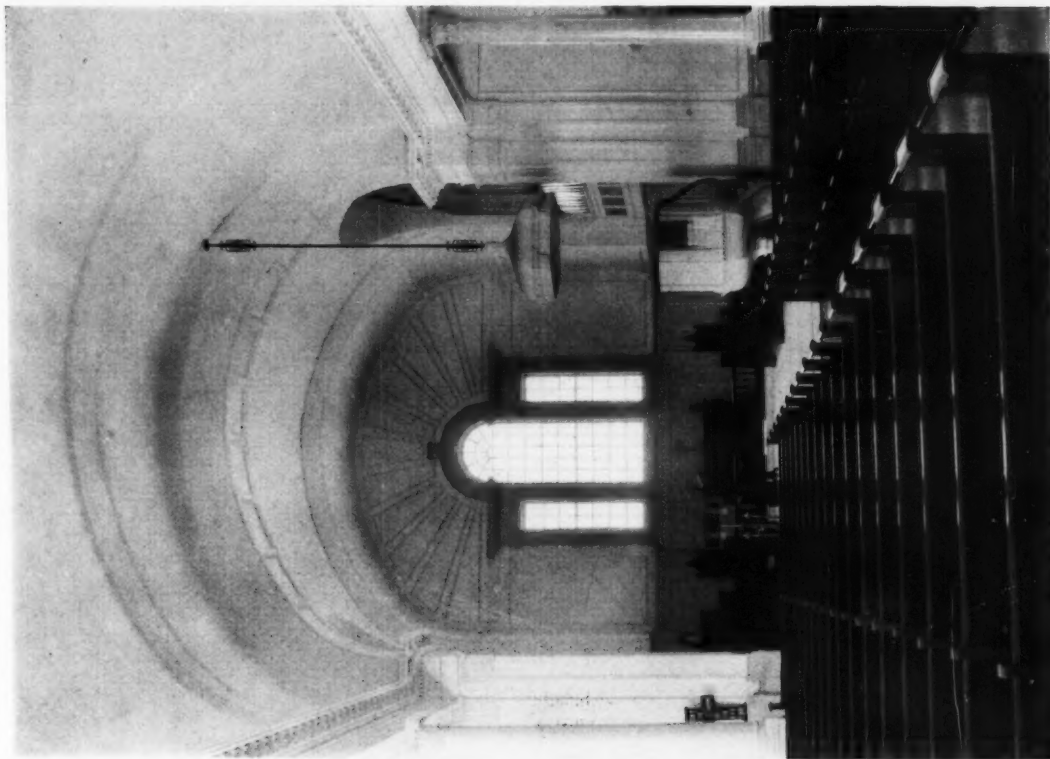
MAIN FLOOR PLAN



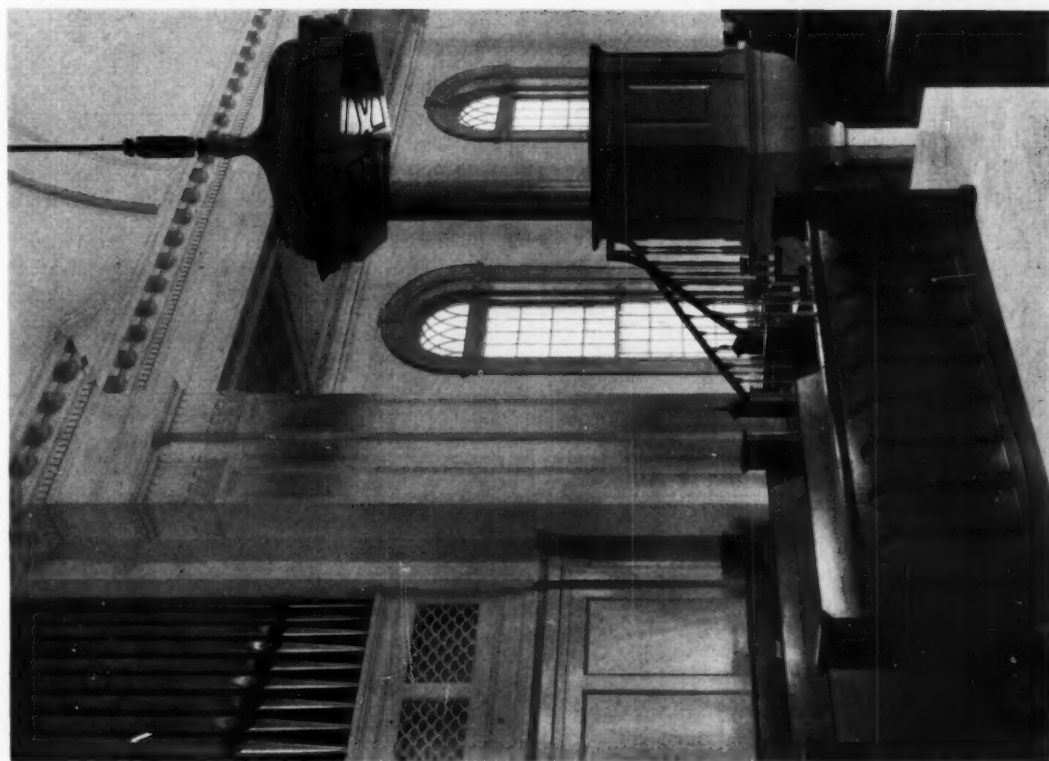
VIEW OF ENTRANCE PORTICO

ST. MARK'S CHURCH, RICHMOND, VA.  
BASKERVILLE & LAMBERT, ARCHITECTS

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INTERIOR, LOOKING TOWARD SANCTUARY



VIEW OF CHOIR AND PULPIT

ST. MARK'S CHURCH, RICHMOND, VA.  
BASKERVILLE & LAMBERT, ARCHITECTS

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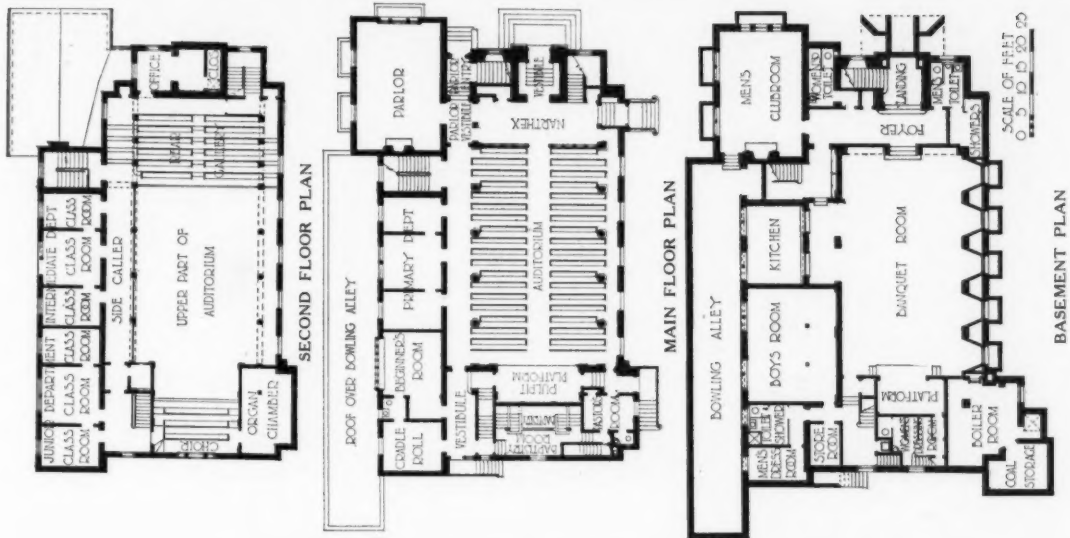
THE design of this building was based on Colonial tradition, but adapted to the needs of a present-day Baptist congregation requiring considerable equipment for educational and social purposes. Main auditorium used for general assembly of Sunday School; classrooms opening from auditorium for individual instruction.

Readily accessible from narthex are rooms for a men's club, a large room for meetings and dinners, a room for boys, and shower baths and bowling alleys. Exterior of building brick and limestone, with trimming of wood, painted. Cost of building \$96,000 or about 32 cents per cubic foot.

FIRST BAPTIST CHURCH, JAMAICA, N. Y.  
JOSEPH HUDNUT, ARCHITECT; W. E. MANHART, ASSOCIATE

*Photos. John Wallace Gillies*

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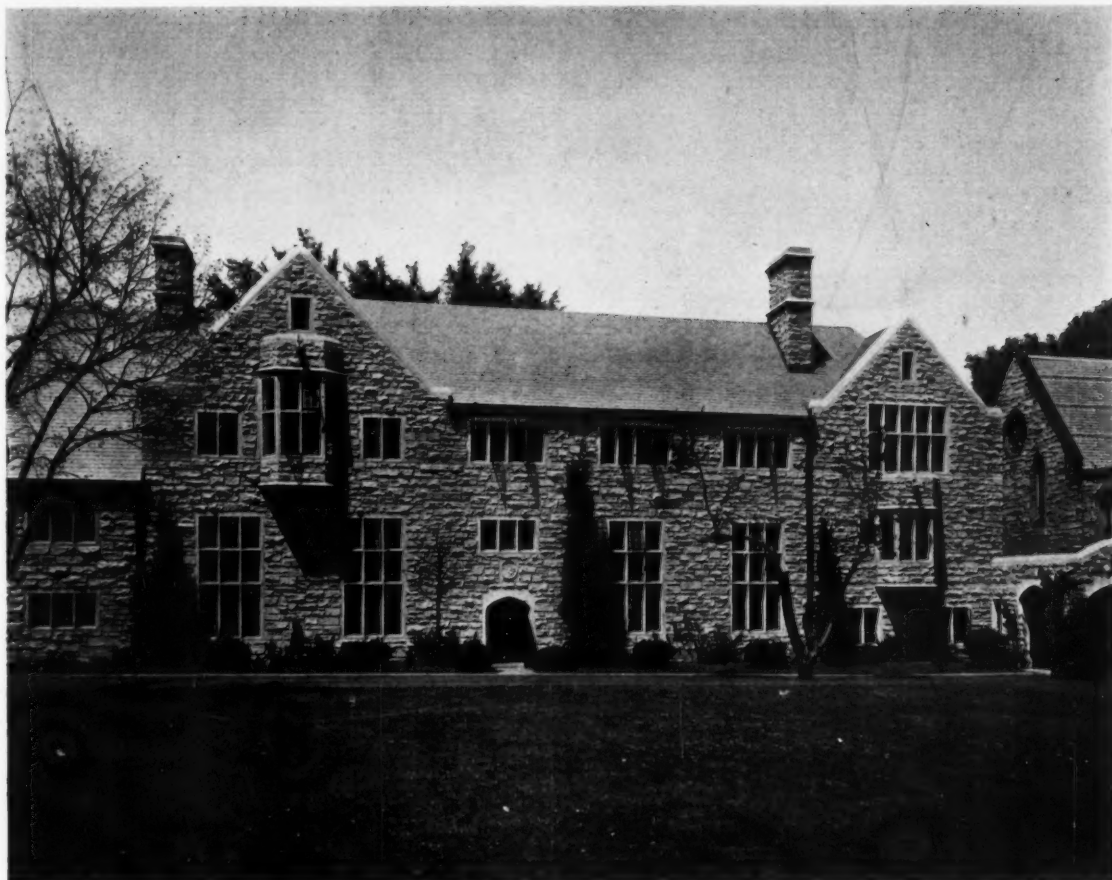


VIEW OF NORTH AISLE

FIRST BAPTIST CHURCH, JAMAICA, N. Y.  
JOSEPH HUDNUT, ARCHITECT; W. E. MANHART, ASSOCIATE

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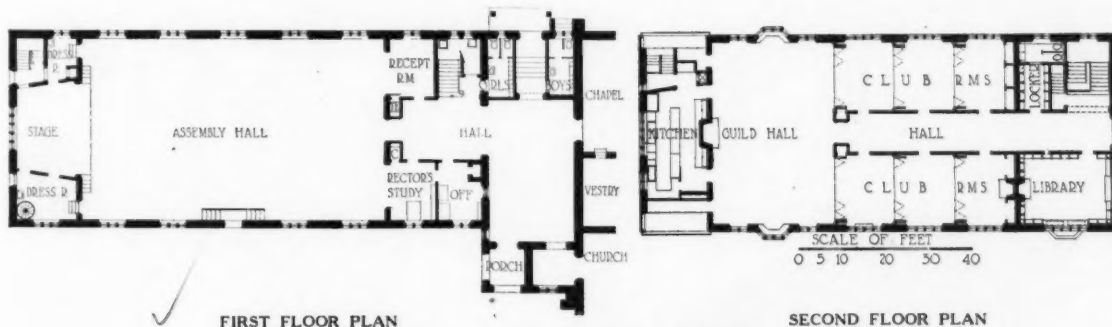


GENERAL VIEW OF BUILDING

THE material used for the exterior of this building as well as its general style was determined by the necessity of securing architectural agreement between the existing church building and the newer structure which adjoins. It was desired that the church house supply facilities for parish work of a somewhat broad and varied nature, with ample equipment for the meetings of guilds and also for activities which are likely to involve the participation of large numbers of people.

All of these activities have been provided for; the upper floor of the church house contains two suites of three club rooms each, which on occasion are easily made into one large room, while both of the suites open

into a large guild hall which is provided with kitchen and serving pantry. Upon the ground floor there is a spacious assembly room with an entrance directly from without as well as from the hall between the church and the church house. This assembly hall is equipped with every convenience, including stage and dressing rooms. The building also makes provision for a parish library, and what is particularly to be noted is the suite of offices in the church house for the rector or the members of his staff who supervise its activities. The interiors are dignified while possessing at the same time an appropriately domestic character, and finish is in keeping with the purposes of the building.



FIRST FLOOR PLAN

SECOND FLOOR PLAN

CHURCH HOUSE, ST. JOHN'S CHURCH, WATERBURY, CONN.

RICHARD H. DANA, JR., ARCHITECT

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DETAIL OF MAIN ENTRANCE  
CHURCH HOUSE, ST. JOHN'S CHURCH, WATERBURY, CONN.  
RICHARD H. DANA, JR., ARCHITECT



ENTRANCE TO ASSEMBLY HALL  
CHURCH HOUSE, ST. JOHN'S CHURCH, WATERBURY, CONN.  
RICHARD H. DANA, JR., ARCHITECT

*Photos. Kenneth Clark*

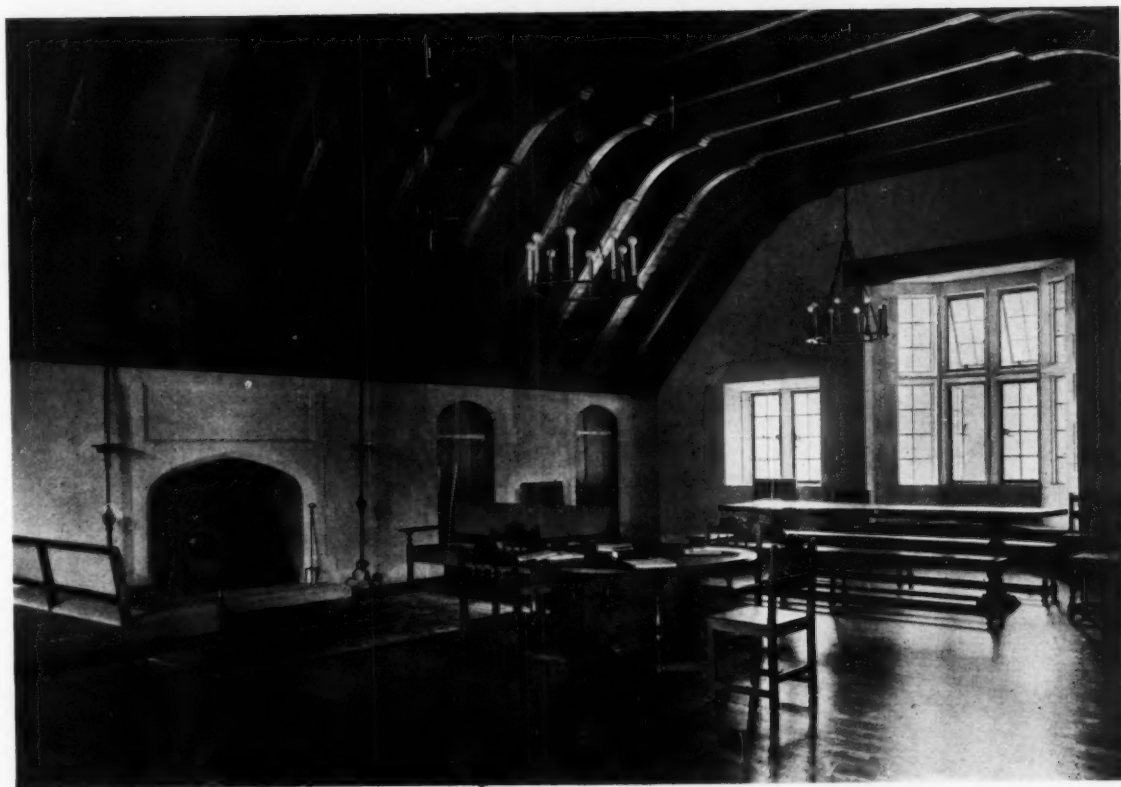
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VIEW OF ASSEMBLY HALL, FACING STAGE



ONE END OF THE GUILD HALL  
CHURCH HOUSE, ST. JOHN'S CHURCH, WATERBURY, CONN.  
RICHARD H. DANA, JR., ARCHITECT

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## ✓ Recent Altars and Other Accessories

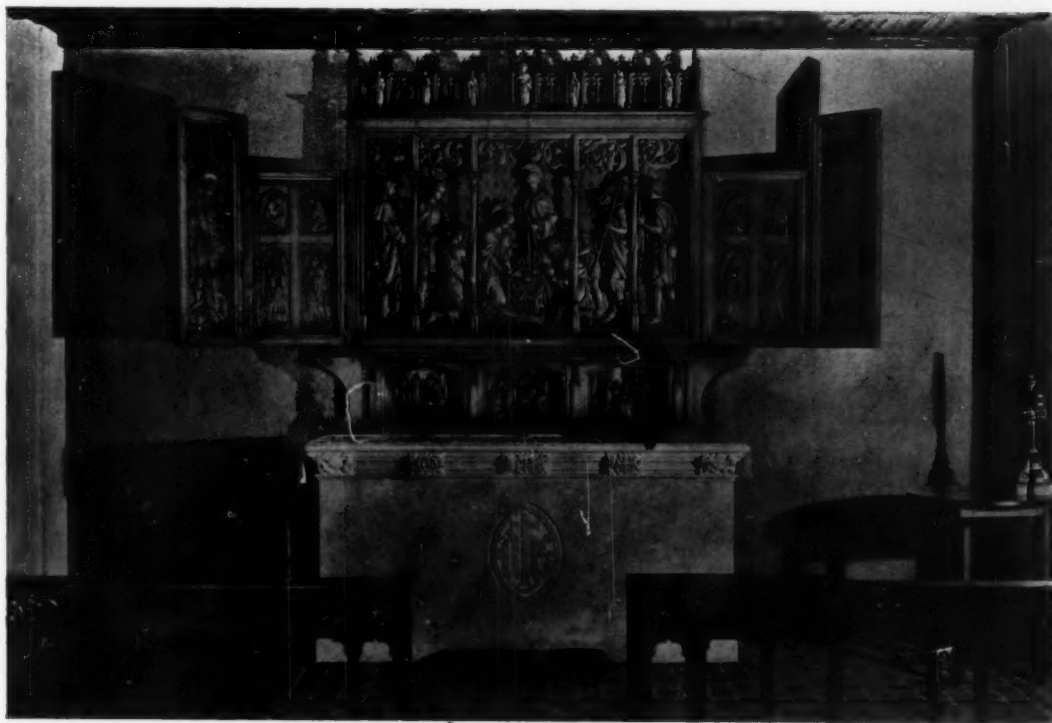
THE triumphs of Gothic art or of art in general, and particularly of architecture, cannot be said to belong exclusively to any one era or any one country. The mediæval period in Europe saw, it is true, a marvelous flowering of ecclesiastical art of every kind, but the flowering was not wholly spontaneous but was rather called into being by a demand for its masterpieces and by the encouragement which such a demand presupposed. The arts which serve religion were for almost a century to a great extent overlooked or ignored, but architects and workers in the various crafts are once more receiving encouragement and patronage which have led to a revival of these arts. While architects have been absorbed with study of



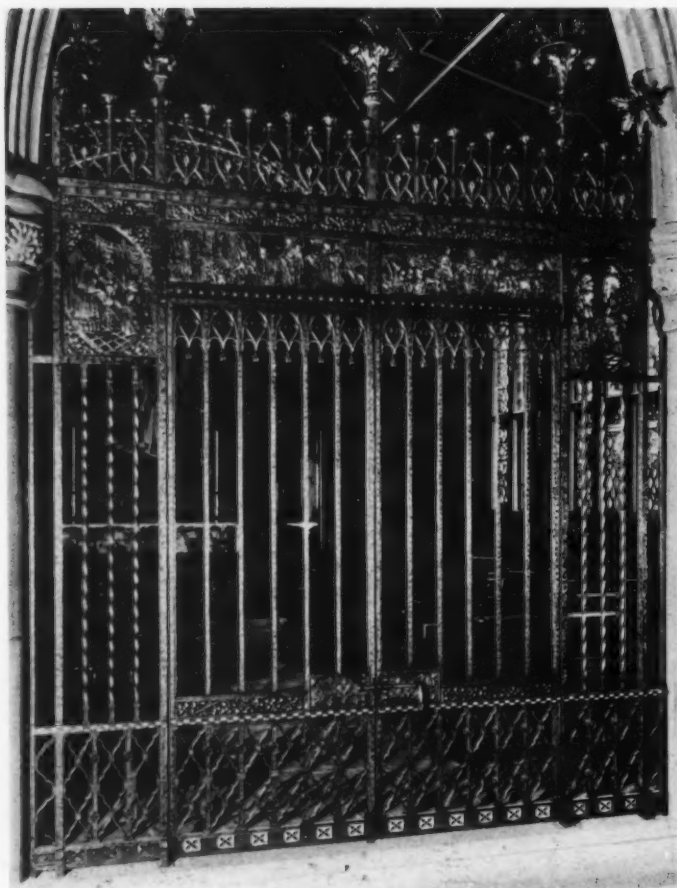
Organ Case, Emmanuel Church, Baltimore  
Woldemar H. Ritter, Architect

design and structure, artisans of every kind have been acquiring anew the skill of the craftsmen of long ago and, stimulated by an ever-growing appreciation on the part of patrons, have already produced work which would have done credit to workers of earlier centuries and other lands. While preëminently true of stained glass, which demands discussion all its own, it is particularly true of such arts as metal working and carving, whether in stone or wood.

In and around New York, among many examples of excellent work which has been done within the past few years, there are several examples of church accessories in wood carving or metalwork which are notable. Among them are the triptych at St. Paul's, Flatbush, and



Altar in Chapel of Remembrance, Church of St. Michael and All Angels, Baltimore  
Woldemar H. Ritter, Architect



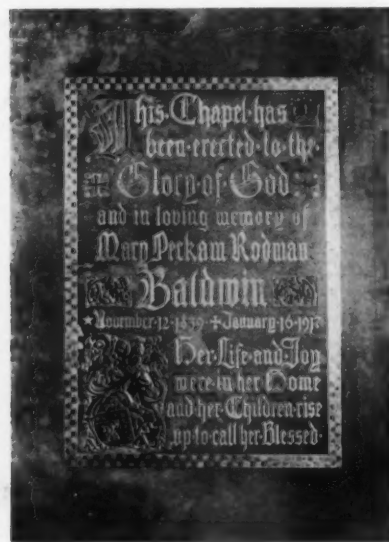
Iron Grille, Grace and St. Peter's Church, Baltimore  
Woldemar H. Ritter, Architect



Sacristy, Emmanuel Church, Baltimore  
Woldemar H. Ritter, Architect

the arrangement of the main altar at St. Luke's Chapel, Hudson Street, of which Wilfred E. Anthony is architect. The triptych is a beautiful example of this ancient form of over-altar treatment, and its ornament of painting, carving, coloring and gilding is so disposed that when the triptych is closed, during the penitential seasons of Advent and Lent, it is only a little less rich and glorious than at other times when its full splendor is revealed. The altar at St. Luke's is arranged with a low reredos with riddels, the riddel posts being of a very correct and beautiful character and the hangings themselves laced to the supports in true Gothic fashion. The altar proper is admirably arranged, the cross and candlesticks resting directly on the mensa, and the altar covered with undecorated linen. Among the most notable examples of metalwork made within recent years are the grilles which divide several chapels from the nave at the Church of St. Vincent Ferrer, New York, of which Bertram Grosvenor Goodhue is architect, and the tabernacle of metal and enamel upon the high altar which was also designed in Mr. Goodhue's office.

The altar at St. John's, Newport, of which Cram & Ferguson are architects, while already fairly well known, is included here because it ranks as a superlatively rich and beautiful example of craftsmanship of several



Memorial Tablet in Floor of Chapel  
Woldemar H. Ritter, Architect





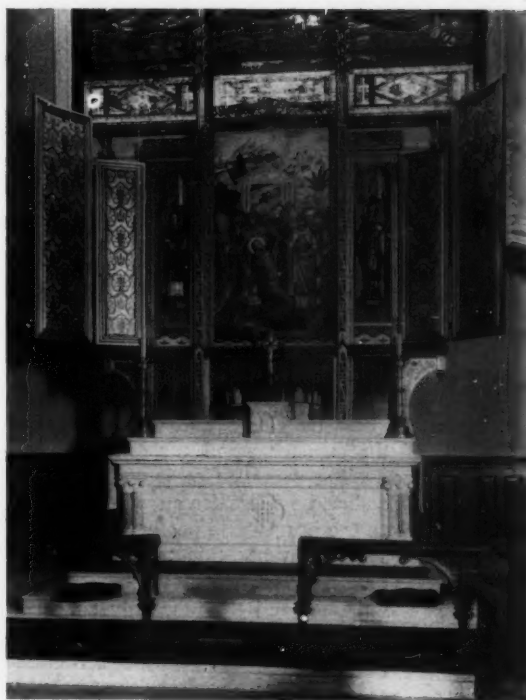
ALTAR AND REREDOS IN LADY CHAPEL, GRACE AND ST. PETER'S CHURCH, BALTIMORE  
WOLDEMAR H. RITTER, ARCHITECT



ALTAR OF EMMANUEL CHURCH, BALTIMORE  
WOLDEMAR H. RITTER, ARCHITECT



Triptych Closed During Advent and Lent



Wings Opened at Other Times

Altarpiece in Form of a Triptych, St. Paul's Church, Flatbush, New York

Wilfred E. Anthony, Architect

kinds. Its carving is among the best examples of modern work, and its tabernacle of metal and enamel is equal in importance to the carving which surrounds it. The painting is by a member of one of the religious orders of the Episcopal Church.

In Baltimore there are numerous examples of excellent craftsmanship designed by Woldemar H. Ritter, from which have been selected a few of the more important examples. The altar in the Chapel of Remembrance in the Church of St. Michael and All Angels is a splendid example of appreciation of carefully studied proportions. The relation of the mass of the plain, rectangular marble altar to the richly carved and ornamented triptych above is most successful. In the very low relief of the carved paneled doors of the triptych a pleasant contrast with the high relief of the carved Nativity is obtained, thus attracting the eye to the primary focal point of the whole composition as to its true center.

Tabernacle of High Altar  
St. Vincent Ferrer's, New York  
Bertram Grosvenor Goodhue, Architect

In Emmanuel Church Mr. Ritter has taken unusual care in the design and details of the sacristy. Walls paneled in dark oak make a pleasing contrast with the slightly curved rough plaster ceiling. The paneling forms the concealed doors of the vestment cases. One wall is broken successfully by a small recessed altar of pleasing simplicity and proportions. This fortunate note of religious significance, as well as the delicately modeled ceiling decoration of cross and crown of thorns, gives to this small room a dignity and distinction indicative of its purpose. His design for the organ case in this church is simple in composition, but rich in well balanced and carefully placed decoration. The hood of the projecting bank of trumpets and the balancing banks of horns are ornamented with tracery elaborately carved in flowing floral scrolls of Gothic symbols suggestive of the passion flower and the fruits of the spirit. Grotesque figures holding musical

instruments enrich the cresting and corner finials. As in the case of the altar designs, Mr. Ritter has again achieved a happy contrast and balance between the plain and the ornamented elements of the design. The reredos of Emmanuel Church is a carved design of sumptuous richness, executed in Indiana limestone, with a delicacy of detail recalling the elaborate fifteenth century examples at Winchester and Seville. Although smaller in size and lacking in color decoration, it suggests the gorgeous new reredos of St. Thomas' Church, New York. The rich brocade of the antependium gives a pleasing note of color below, repeated in the stained glass of the window above. The design is rich in repeated pedestals and elaborately canopied niches carrying figures of saints and angels, grouped about the central figure of Christ. These figures in stone are the work of that master wood carver of Boston, L. Kirchmayer. The present Gothic revival in this country has produced no craftsman who has contributed more to the beauty and perfection of ecclesiastical decoration than has this talented sculptor in wood and stone.

Between the chancel and the new lady chapel of Grace and St. Peter's Church, also in Baltimore, a wrought iron grille with gates, richly decorated in the manner of the fifteenth century, serves as a screen. Its dignity of design and balance of detail are very satisfying. Deference for the material used and understanding of its purpose characterize this ironwork. Deep horizontal panels of repeated quatrefoils form the base, balanced above a field of



Altar at St. Luke's Chapel, New York  
Reredos with riddels and gothic polychromed riddel posts  
Wilfred E. Anthony, Architect



Reredos with Richly Carved Canopy  
Altar in Chapel in St. John's Church, Newport  
Cram & Ferguson, Architects

slender vertical bars by a richly decorated frieze of four pierced picture panels, surmounted by an ornate cresting divided by five important and floriated finials.

In this chapel the oak paneling of the altar niche forms a rich background for the brilliantly colored woodwork and painting of the triptych. The ample use of gold and color on the frame and doors of the triptych repeats in modified tones the colors of the painting which forms its central panel. This painting on wood is a magnificent copy of Filippo Lippi's "Adoration," executed by Elizabeth Born. The inner frame is almost completely covered with color, while the outer parts are only touched with it, gradually fading into the dark brown of the background. This transition from the clear and vivid color of the tempera painting of the Adoration to the rich shadows of the altar niche, draws the eye to the focal point of the chapel. This visual attraction to the altar is further enhanced by placing in the upper corner of the rear wall a window filled with amber glass which illuminates the painting of the Madonna and its brilliant triptych.

The floor of this chapel is of Vermont slate, in the center of which is set a unique dedicatory tablet. This tablet is an interesting example of the English type of Gothic inlaid metalwork. The tablet itself is slate into which are set the letters and decoration. Bronze and pewter have been used for the inscription, initials, name and decorations. The diaper pattern border is made of bronze into which are cast alternating squares of pewter. This use of several metals give a richness and variety of tone and color unobtainable from the use of one metal alone. It is the first example of the use of metals inlaid in slate produced in this country, a notable triumph of skill.



## Church Furnishings

By E. DONALD ROBB

A DISCUSSION of church furnishings properly begins with a consideration of the altar or "God's Board," the one essential piece of furniture in the early Church, and today the most important of a score of pieces, large and small, used in the elaborate service of the ritualistic bodies of the Christian Church, and in many instances given the first place by many of those having less formal ideas on the subject of divine worship. Signs are plentiful in church circles to indicate that at no distant day the altar will be restored to its original place of preëminence, and its rivals, the trained quartette, the organ and the pulpit, will be relegated to their proper positions.

It is not the function of the architect, however, to engage in discussions ecclesiastical over the relative importance of articles of furniture, one to another. When this question has been settled by the churchmen, his clients, it is his duty to arrange each piece so as to produce architectural harmony. It is true that in any composition one thing must occupy the focal position; in a church interior this position is obviously at or near the end of the main axis. If, in this land of religious liberty, where clients are privileged to worship in accordance with the dictates of their own consciences, it has previously been decided, for instance, that the collection plate is the most important object used in the service of worship, then it is the business of the architect to plan accordingly. It is better to let conditions govern, provided they are not mere prejudices, than to force each set of requirements into an ancient mould where they will never be comfortable, and which, for all we know, may be outgrown. The architect may have his own opinions on such subjects, but he can best serve the client by working with him, not against him.

It is not at all imperative that a chancel be arranged after the custom established by the Episcopal

or the Roman Catholic Churches in order to be dignified and, to a certain extent, solemn. Examples abound in the Colonial churches where effects of great dignity have been produced without following the mediæval arrangement. This is possible also in churches designed after the Gothic manner, although association seems to demand the deep chancel in this case. It is rarely possible to put the singers in the gallery across the east end of the chancel and have dignity as a result. The church will immediately take on the character of a concert hall—even the pulpit will sink into insignificance. Church music should be directed eastward, not westward.

The first altars were of wood, probably very simple tables. The custom of using this material still survives in the Eastern Church, and continued in England until nearly the end of the eleventh century, when the Council of Winchester ordered the wooden altars throughout the realm to be demolished and altars of stone consecrated. These were originally severely plain, consisting of single slabs of freestone or marble incised with the five crosses, perhaps beveled on the lower edges and supported on pedestals, on four or five legs, or occasionally on stone brackets. The development from this simple form to the more elaborate types of the fifteenth century was



Trinity Church, Princeton, N. J.  
Cram, Goodhue & Ferguson, Architects

steady, until the Reformation brought a return of the wooden table, when many of the old stone slabs were overthrown and broken, or used as paving stones. The use of wooden tables at this time, while common in the reformed Church, was not made compulsory. Some of these tables, lately associated with more domestic uses, were very beautiful and of fine workmanship, their bulbous or "melon" legs being their most striking characteristic. Many of them could be extended, and from this it is obvious that they must have been used in a very different manner from those of a more ancient day. Such is, indeed, the case, for when Com-



Altar in Chapel of Sts. Patrick and Bridget  
Church of St. Vincent Ferrer, New York  
Bertram Grosvenor Goodhue, Architect

munion was held in the days of the Commonwealth, the altar tables were carried out of the chancels and into the naves, where the participants seated themselves around the extended boards.

As this custom, happily, disappeared with the Cromwellian regime in England and, at least as far as the writer's knowledge extends, has never been revived in any of the many denominations of the Christian Church, it need not here be given much space. It will be well for us to consider, however, the types of altar now in use, calling attention to their points, good and bad. The most common form used in liturgical churches, but neither the most ancient nor the most dignified, is that type solid to the floor in front and at the sides, supporting a tabernacle and usually two gradines on which stand cross, candlesticks and vases for flowers. This type, carried to its logical conclusion by the purveyors of stock furnishings, has been described with more truth than reverence as a "glorified soda fountain"; or with its gradines increased to four or five, each loaded to capacity, it reminds one of a show window in a cheap retail store—thus defeating its artistic end, which should be to induce a spirit of reverence and devotion.

At the opposite extreme is the altar of the "Sarum" type without gradines or tabernacle, the cross and candlesticks, two or six in number, standing directly on the *mensa*. This was the form most common in pre-Reformation days. At altars where the Sacrament was reserved, the hanging pyx was used, this frequently taking the form of a dove of

gold or silver, sometimes richly enameled or set with jewels. Immediately over this hung the pyx cloth and canopy of richly ornamented material. Where the Sacrament is to be reserved on the altar in a Roman Catholic or advanced Episcopal church a tabernacle is necessary, and at least one gradine for cross and candlesticks is likely to be desired. The tabernacle may be of wood or metal. It should contain a steel safe so secured as to be difficult to remove even though the outer door should be forced. This door is usually decorated in relief with symbols of the Passion, the most common being the Chalice and Host, the grapes and wheat, the pelican piercing her breast to nourish her young, and the sacrificial lamb.

From the earliest times it has been customary to provide some sort of screen or special background for the altar. This sometimes took the form of a painting upon the wall against which the altar stood, sometimes a hanging or dorsal with or without side curtains (*riddels*), and sometimes a more strictly architectural structure of wood or stone, often extremely rich in carving or painted decoration or both. Frequently *riddels* and *reredos* are seen in combination; occasionally dorsal and *riddels* in an architectural frame of carved and gilded wood. Color and gold may be used here without stint if this is to be, as it should be, the center of interest. Color and gold leaf, used extensively in the middle



Altar in Friars' Chapel  
Church of St. Vincent Ferrer, New York

ages, and recently revived in England, is becoming more and more familiar to us in this country. Its first appearance here was timid and attended with much "antiquing" lest it appear garish. This need never be done if the secret of such color decoration be understood, that is to avoid large, unbroken areas of any color, or even gold. When it seems difficult to adhere to this rule, as in the case of a background color, or in the garments of a figure, a pattern of gold or black will accomplish the result and give much enrichment. Another rule of great importance to be observed is the avoidance of placing color next to color without a separating stripe of black, white or gold. Color schemes should be simple, and usually limited to red, green, blue, white, black and gold. Tertiary colors may be used sparingly on drapery. Several good examples of reredoses, carved, sculptured, and painted in color and gold are shown here as illustrations—recent work from the offices of Bertram Grosvenor Goodhue, Cram & Ferguson, Wilfred E. Anthony, and Perry, Shaw & Hepburn. The beautiful reredos in the chantry at St. Thomas', New York, is easily the best single piece in that place of splendor and symbolism.

Opinions may differ as to the piece next in order of importance. Some may consider the font, from the sacramental nature of its use, as the equal of the altar. Some, and these are very numerous indeed, would place the pulpit in an equally important place. Others of the liturgical persuasion would so regard the credence; still others, the lectern. Let us consider the lectern next.

It was customary in the middle ages to provide in the chancel a lectern, from which the Gospel was read. This was usually a movable desk, but sometimes it was built into the north or Gospel side wall of the chancel. Another lectern stood in the space between the choir stalls, and held the great books from which the choir sang. These lecterns were generally of two or four sides, many of them extremely rich in carving, and with shafts and bases elaborately buttressed and moulded. The brass eagle or pelican lectern did not appear until the sixteenth century. At the time of the Reformation the chancel lecterns were brought forward to the chancel entrances, where places often had to be made to receive them in existing choir screens. This is



Fine Polychrome Decoration on Altars, Tester and Rood Screen

Wilfred E. Anthony, Architect

their customary place today in parish churches. In cathedrals or in conventual churches they are still to be found in the chancel as well as in the choir screens. As to the placing of the lectern, north or south of the chancel entrance, there seems to be no well established rule among liturgical bodies. In the parish church where the bishop's chair stands on the north side of the sanctuary, it seems proper to place the pulpit on the south side; the lectern then takes its place on the opposite side. The type of lectern common to the Gothic church, while frequently beautiful, is usually insignificant—if one considers its important use in the church service. More appropriate in their size and arrangement are the *ambos* of the early Italian churches. With these in mind, let us picture the ideal Gothic lectern.

The sacred character of its function will be proclaimed by its size, elevation and enrichment, and the fact that it will be approached from within the chancel parapet. Its floor level will be higher than the level of the floor in the pulpit opposite, for its message is from a higher source. It will be in two parts and of two materials, suggesting the two grand divisions of Scripture, the Old and the New Testaments. The base will be of stone, the more ancient material supporting the parapet and superstructure, which will be of wood, a material higher in the order of creation. The theme of its decoration will be the unity of Scripture. Sculptured panels in bas-relief in the stone base will match—subject to subject—with panels in the wood parapet above in some such manner as this: The giving of the Ten Commandments paralleled by the Sermon on the Mount and the giving of the Beatitudes. Moses lifting up the serpent in the wilderness, in juxtaposition to the Crucifixion. Melchizedek, king and priest, bearing





Eagle, in Stone and Mosaic  
Lectern, St. Bartholomew's, New York  
Bertram Grosvenor Goodhue, Architect



Lectern of Eagle Type  
St. Paul's, Newburyport, Mass.  
Perry, Shaw & Hepburn, Architects

bread and wine, with Christ at the Last Supper, and other examples of a similar nature. At the four free corners of the lectern will be four niches in which will be found figures of the four major prophets, bearing on their shoulders the four evangelists, as pictured in the great south transept window at Chartres. The central panel of sculpture will show Christ opening the Hebrew Scriptures to His disciples, and explaining therein the things concerning Himself. The bookrest will be richly carved and overlaid with gold, and over all a canopied tester will be built in spirelike form against the chancel pier.

Few pulpits antedating the fifteenth century are to be found today. Their use before that time seems not to have been general. Their position was usually against the first free-standing pier west of the chancel arch, sometimes on the north, sometimes on the south side; but many were later moved to their present positions against the choir screens. Frequently they were most elaborately decorated, and very often quite small and slender, in some cases of slightly more than 2 feet inside diameter. This added greatly to their grace and scale, if not to the comfort of the preachers. The hexagon seems

to be the most common form, with the octagon almost equally popular, although nine- and twelve-sided pulpits are not uncommon. Doors to pulpits may or may not be used. Many were at one time provided with doors, now usually missing, and in most instances the steps are modern. Bases were often of stone, especially in the earlier examples, while in the later types the superstructure rests on a slender stem with moulded cap and base branching out with graceful coving to meet the sill. Wherever it is possible, the pulpit should be placed against a masonry wall or broad pier, for acoustical reasons. In a very long church it may be necessary to locate it against one of the nave piers, although objections will inevitably be raised to this by those who occupy the front pews. There are instances where front pews are so

arranged that their occupants may turn about to face the pulpit at the time of a sermon. In mediæval days, when the congregation stood through the whole service, the pulpit could be located almost anywhere without inconvenience.

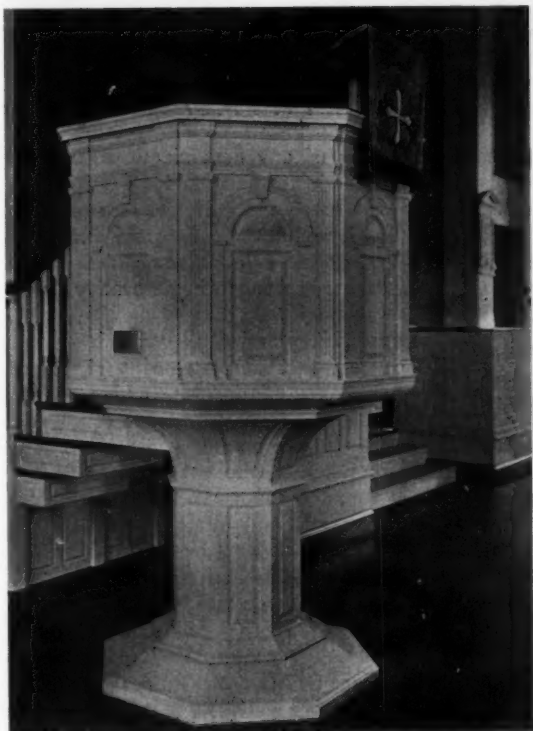
In a sacramental sense the font is next in importance to the altar, although frequently in liturgical as well as in non-liturgical churches it is forced to occupy a very unimportant position in the church. Its historical and symbolical position is near the main entrance, and whenever possible it should be so placed. The desirability of having it located so that a certain portion of the seating space is available for private baptisms, or when the sacrament is performed during the regular service so that all may witness the ceremony, has led to the custom of having the font placed well up toward the chancel.

Fonts are most frequently of stone, although old ones of wood, lead and even brick, dating from pre-Reformation times, are still in existence in England. The favorite shape has always been the octagon—eight signifying re-creation or re-birth, the first creation occupying seven days, the eighth marking the beginning of new life. Circular fonts are very common, however, and one occasionally meets with





Pulpit and Chancel Chairs, Unitarian Church, Fall River, Mass.  
Parker Morse Hooper, Architect



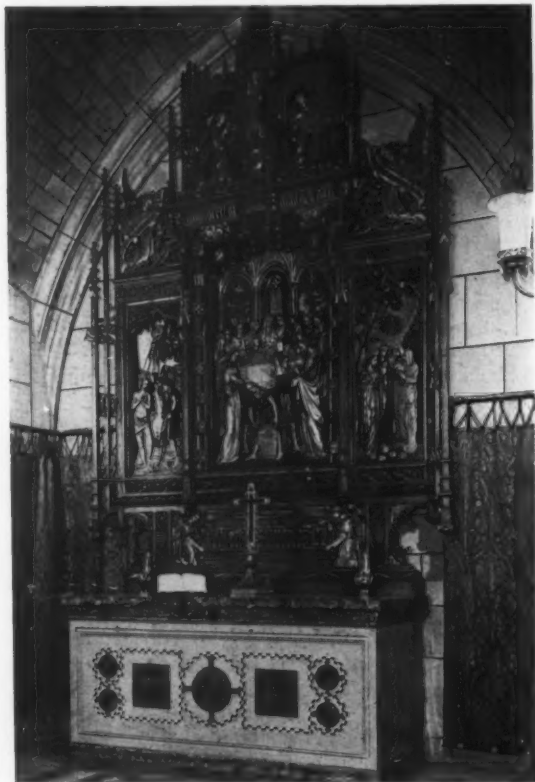
Pulpit, St. Paul's, Newburyport, Mass.  
Perry, Shaw & Hepburn, Architects

square, hexagonal, heptagonal, or even pentagonal fonts. The earliest fonts are of the "tub" shape, without base. The chalice form, surrounded by small columns, was also characteristic of early mediæval days. While it is a modern custom to elevate the font three steps above the floor, this is not by any means the traditional practice. In fact there seems to have been no fixed rule governing this matter, and fonts raised one step, or two steps are quite as numerous as those elevated three steps in height. There are also many instances of fonts set directly on the nave floor.

The font cover affords a wonderfully fine opportunity for interesting craftsmanship, and for the display of mechanical ingenuity in designing the raising and lowering devices. The original object of the font cover was to prevent the improper use or profanation of the water which was always kept in the font. The cover must be provided with some means of locking, and must be kept locked except when in use. The more pretentious covers usually took the form of elaborate spires, raised by means of counterbalanced weights often, but not always, within the spire itself, the whole being suspended from a bracket or from the roof timbers. Stationary covers provided with doors are also common, and provide an opportunity for figure decoration on the inside and hardware on the outside. An unusual and interesting form of cover is that of the sixteenth century font at Trunch, in Norfolk, England—an elaborate affair supported from the floor on

six posts, and forming a canopy over the font, with sufficient room on all sides for the officiating priest. Carried out in the most elaborate form, with tier upon tier of canopied niches, gradually diminishing into a delicate spirelike pinnacle, crowned with its dove or pelican, the whole structure gilded and colored, this font cover presents a gorgeous spectacle, rivaling in splendor the reredos itself.

Volumes might be, and indeed have been, written about the choir and parclose screens of the late middle ages in England; but within the limits of a short paper it is not possible to give them much more than passing mention. The popularity of the screen is easily understood, for it offers exceptional opportunities to the designer and wood carver and adds much to the effect of dignity and mystery in the church. While their purpose seems to have been largely symbolic and æsthetic, screens were in many instances combined with the rood loft and used by the priest in reading the Epistle and Gospel, or as musicians' galleries. In this form, with the vaulted overhangs rich in carving and tracery and often decorated in color, they are perhaps the most beautiful creations of the wood workers' art which have come down to us from mediæval England. Although their use today will necessarily be limited to churches of a "high" tendency, they offer suggestions in simplified form for narthex and gallery



Chantry Altar, St. Thomas' Church, New York  
Cram, Goodhue & Ferguson, Architects

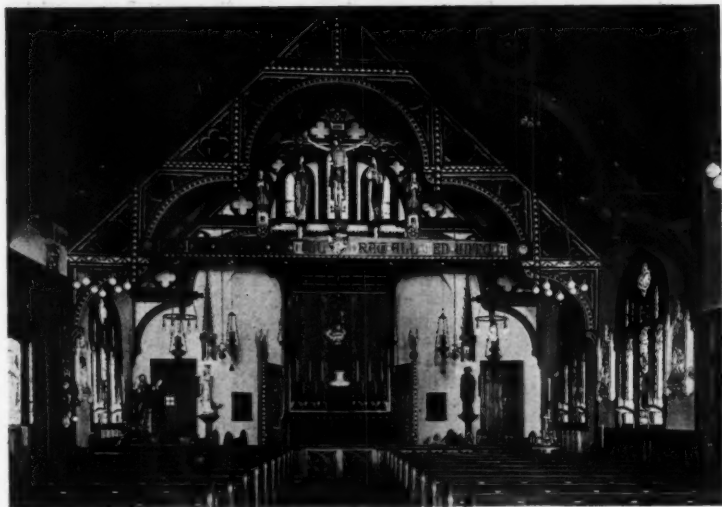


Lady Altar, All Saints', Dorchester, Mass.  
Cram, Goodhue & Ferguson, Architects

screens in churches of any denominations, or even in parish halls. Their running bands of exquisitely carved grape and other vines offer a never-failing supply of suggestions for the artist, while the few surviving painted panels give us some idea of the skill of the mediæval craftsman in decorative figure painting.

Of all the furnishings and fittings which go into the modern church, that which is of the greatest interest to the majority of the congregation is the organ. In this instance, and in but one other—the lighting fixtures—we have no mediæval precedent to draw upon; for while in every other respect the churches of the middle ages are well worthy of emulation, their organs and other musical instruments were of the most primitive sort. Development in music and musical instruments since the days of the great church builders has gone far toward making amends for the decline in the arts of stained glass and figure sculpture. There are, of course, a few organs and organ cases dating back to the Renaissance, but the problem of the organ, its housing and decoration is essentially modern.

The location of the organ chamber (so says the organ builder) is one of the most important con-



View of Nave and Sanctuary  
Church of the Holy Innocents, Pleasantville, N. Y.  
Gothic altar with tester, dorsal and riddels

siderations in the planning of the church. This would indeed be true, were the church a concert hall; but, while the organ is an important detail in the church furnishings, and every effort should be made to provide adequate space for its intricate and delicate mechanism, the real purpose of the church must always be kept clearly in mind, and its various parts arranged in proper order. Although he never expects us to follow his advice, we should always consult the organ builder at an early stage in the preparation of drawings for the church. He will tell us that the chamber should have a clear inside height, over as large an area as possible, of 22 feet, and that it should open out into the church with an opening as large as space will permit. It should not be located near a chimney, neither should it be lighted by windows, unless double glass be provided. In order to protect the organ from possible damage by leaky roofs, a protective roof of timber covered with some good roofing material should be hung from the rafters of the chamber and connected at its lower side with a drain. There must be a motor room provided somewhere nearby, with the possibility of obtaining air direct from the church. As the motor is frequently noisy, it must be sound-proofed from the church proper. If it is in the cellar, there must be a pipe provided for the delivery of air to the organ above. This will be a round pipe 10 or 12 inches in diameter. The console with its bench will occupy a floor space 6 feet square, and unless

one is watchful it will be found to be very bulky. By sinking it a step or two below the neighboring choir benches it will not be too much in evidence. Its proper location, with respect to the organ, is on the opposite side of the chancel.

Where the organ and singers are located in a gallery at the west end of the church, the chance of the organ tones being stifled is removed, and both organ and choir act as supports to the congregational singing. The earliest of the large organs, those of early post-Reformation days, were usually built on the rood screens, displacing the then unpopular rood. In this position, with the small choir organ facing the choir, and the great organ fronting toward the congregation, there was nothing to interfere with the per-

fect operation of the instrument. Æsthetically, however, it does not seem correct to block the main axis with an object of secondary importance.

Of the remaining furniture of the chancel and sanctuary, altar rail, choir benches, bishop's chair and kneeler, little can be said without exceeding the limited space assigned to this paper. A word of advice to the novice in Gothic design may not be out of place at this point, which is that it is dangerous to try for originality, since disaster will surely follow. In fact it is not too much to say that this applies to the expert as well. A too apparent attempt at originality, even though artistically successful, makes too much of a self-conscious display of one's "personality" to be good Gothic, besides being quite out of



Students' Chapel, Boston College  
Maginnis & Walsh, Architects





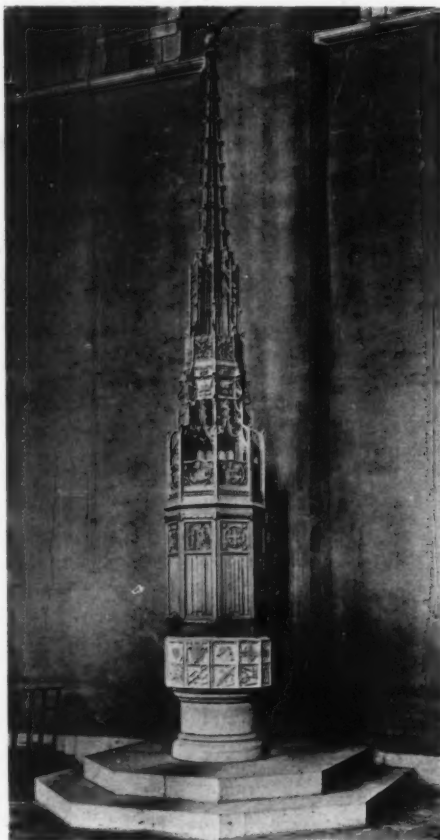
Triptych, Chapel of the Intercession, New York  
Bertram Grosvenor Goodhue, Architect



Altar, St. Mark's Church, Mt. Kisco, N. Y.  
Bertram Grosvenor Goodhue, Architect

place in a church. After examining, perhaps with much momentary enjoyment, the stunts and clever tricks of design in some of the best modern examples of furniture, one turns with relief and satisfaction to the fine old work of the middle ages. The one soon becomes tiresome, like a twice-told joke—the other improves with acquaintance, and never fails to arouse our admiration. As it is practically impossible ever to copy anything, line for line, detail for detail, without sooner or later coming to the point where conditions demand something different, it follows that everything we do must in some sense be original. Beyond this point it is dangerous for the novice to venture, and even the experienced must proceed with caution, or his work will be largely a display of "ego."

If it comes to a point of deciding between pews and individual chairs for the seating of the congregation, there are arguments in favor



Font with Gothic Canopy  
Chapel of the Intercession, New York

of each. The average congregation will prefer pews because it has always been used to pews. The idea of the "family pew" still clings, while the family row of chairs lacks the same sentimental appeal. You will be told that pews are more comfortable, which may be true, and that if one has a pew, one always knows where to sit, while chairs always get moved this way and that. The latter is a point in favor of chairs, for they can be moved forward and backward, arranging the spacing to suit the size of the congregation. Chairs are perhaps the more pleasing architecturally, although well designed pews, rather low, and spaced a generous 3 feet or more on center can be very handsome. Square pew ends are to be preferred, but if placed too close together, they impose a hardship on the portly. In designing the supports to the seat, leave plenty of room for kneeling. Make the seats comfortable; there is no rea-

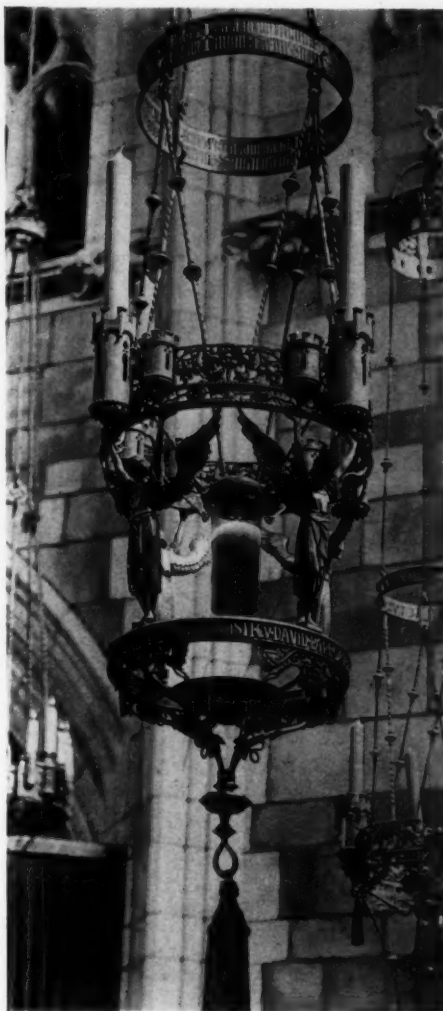


son why one should not be comfortable even in church.

The problem of artificial lighting in its two aspects—practical and artistic—is always with us. There are several ways to do it, and one may take one's choice. Bracket lights may be attached to each pier, with additional brackets on the aisle walls. If the seats in the middle aisle receive any of the light, they are lucky. Or, fixtures may be hung from truss or vault, shedding the light at places best suited to a general distribution. This is efficient, although it does seem silly to wire to the roof and then down again. A modification of this scheme is to drop the lights from projecting brackets. A more reasonable but less usual arrangement is to light from standards set among the pews. This latter scheme can be successfully adopted in the choir stalls, as at Gloucester Cathedral. The effect of the lighting when kept low is much more beautiful, the roof being dim and shadowy. It is better, therefore, both practically and artistically, to design the fixtures so as to shed all of their light downward, and leave the roof in darkness. The individual lighting of pulpit and lectern should not be over-

looked when designing those pieces. Electrified candlesticks with metal or mica shades may stand beside the manuscript desk on the pulpit rail; bracket lights from the sides of the lectern with hooded reflectors to light the page will do well at that place; or, if the lectern stands on the floor, a wrought iron standard by its side will serve the same purpose. The horizontal tubular lamp can also be used on the front of manuscript rack or book rest, if architectural camouflage be provided to cover its commercial nakedness.

To cover the subject of church furnishings adequately, some mention should be made of the fittings of the sacristies and robing rooms as well as of the practice room for the choir. The choir vesting and practice room may be combined if the choir is composed of men and boys only. For a mixed choir, two vesting rooms with toilets will be necessary,



One of Seven Gothic Altar Lamps  
Church of St. Vincent Ferrer, New York  
Bertram Grosvenor Goodhue, Architect

although if space and funds are limited, the larger, possibly the men's, may be used for practice. For this purpose, it should be as large and lofty as possible, approximating the chancel in size, with the seats arranged in the same manner. Where conditions are ideal, the choirmaster has a separate room in which all music is kept. Individual lockers or wardrobes should be provided for cassocks and cottas. Altar vestments are hung, without folding, in cases made especially for that purpose, and may be housed in the working sacristy or in some room convenient to the chancel. Cases for clergy vestments are of course provided in the clergy sacristies, and their number and design will vary with the type of service. A safe, large or small as the case may require, will be needed for altar vessels and plate, or anything of value.

In the designing of church furnishings, to the same extent as in the designing of the church fabric itself, the real purpose of the work should be kept in mind. This purpose is, not to advertise the architect, through the publication or exhibition of his work or in any other way; neither is it to provide him with an entertaining

problem, wherein he can give expression to his "personality" or his pet ideas, theories or hobbies. His work should, by the subtle power of its beauty, combine with the beauty of the music and the ritual to arouse the spirit of worship. The results of his study are, therefore, more than æsthetic, and his problem is more than architectural.

Church bells, and the methods of casting, tuning and mounting, ancient and modern, present a subject which the church architect or any other might pursue to advantage. Every church tower of any size should be built to receive chimes with chamber for ringers below. Chimes rung from a keyboard must obviously be operated by hammers, and the use of this all-too-easy method has resulted in the abuse of the art of bell ringing. Unpleasant overtones produce false harmony, and the effect, except from a great distance, is likely to be altogether disappointing.

# EDITORIAL COMMENT

## RELIGIOUS INFLUENCE UPON ARCHITECTURE

AS architecture is the highest form of art, so art is the sublime material achievement of mankind. It is the natural medium through which humanity interprets the joy of life and demonstrates the extent of its civilization. Springing from the innermost recesses of the human spirit, it is one of the visible and tangible evidences of spiritual power expressed through the medium of the human mind. In "Church Building" Ralph Adams Cram says that art is the result of beautiful ideas, of beautiful modes of life, of beautiful environment, and that in all its forms it owes its inspiration to the Church, without which it could not have existed. The highest expression of the art of a people has always been religious architecture, because the building of a church is in itself an act of worship, a confession of faith. In the progress of building, the religious edifice has led all others; it has furnished precedents and traditions as well as opportunity and inspiration for all the arts; it has made architects famous and workmen skillful and has preserved the continuity of architectural development throughout the centuries. As during the dark days of the middle ages, the Church was the repository of the culture and literature of ancient civilization, so also through the artistic destruction and deterioration of the Reformation it was the guardian of all the art of the past, preserving it for posterity.

Consciously or unconsciously, to many people a church leads the mind back through the past centuries of Christian worship from the beginning of the Church to the present, and embodies the idea of consecutive centuries of devotion, to which we in the present day are adding the latest contribution. The earliest temples erected by the Egyptians for the worship of their deities, 40 centuries before the Christian era, were followed by the highest development of the pagan temples of Greece and Rome, and these temples in turn by the arcaded basilicas of the early Christians, the gorgeous Byzantine and Romanesque churches of the early Catholics, which developed into the dazzling beauty of the full Gothic style in the great cathedrals of France and England. Then the Church largely reverted to classic influence in the highly ornate religious edifices of the Italian Renaissance, influencing during the seven-

teenth and eighteenth centuries the architecture of France, as shown in the styles of the several Louis, and the Empire, and of England, as exemplified in the periods of the several Georges, and carried over the seas to eventually fade away in the American Colonial and Empire or neo-Grec architecture. Thus we can trace the unbroken influence of religion upon architectural development and history.

Although the inspiration of creative art was dulled and diverted by materialism during the greater part of the nineteenth century, the Gothic revival in England, which inaugurated a fresh interest in church architecture, followed as it was in this country by a return to Classic and Renaissance precedent, has gradually given renewed vigor to the architecture of ecclesiastical edifices, evidenced by the splendid churches built both in England and America during the past 20 years in which massiveness of construction, grandeur of scale, dignity of proportion and beauty of well placed decoration all demonstrate the never-ending influence of religion upon architecture.

At the present time the trend of church architecture in this country as well as in England is toward a more conscious and visible expression of the eternal verities for which the Church stands, exemplified by truth of design, integrity of construction, durability of material, grace of proportion, dignity of scale, beauty of detail, symbolism of ornament, warmth of stained glass and richness of furnishings. This endeavor to perpetuate in the religious structure something of the significance of its high purpose is not alone restricted to the architecture of the liturgical Churches. It is indicated quite as distinctly in the recent designs of churches of the various Protestant denominations and the members of its faith which have found a haven in this land of religious freedom, all this evidence of the growing desire and effort to more truthfully and fittingly portray the deep significance of the varied expressions of religious faith in the architecture of the structure which is to be its temple. Never has there been a greater opportunity than there is today for the architect to make a real and lasting impression on civilization and life through his untiring zeal and unceasing effort in the expression of his highest creative instinct in this vast and inspiring field of artistic achievement—the building of the House of God.



View from North Transept  
All Saints', Peterboro, N. H.  
Cram & Ferguson, Architects

# SERVICE SECTION of THE ARCHITECTURAL FORUM

Information on economic aspects of construction and direct service for architects on subjects allied to building, through members of THE FORUM Consultation Committee

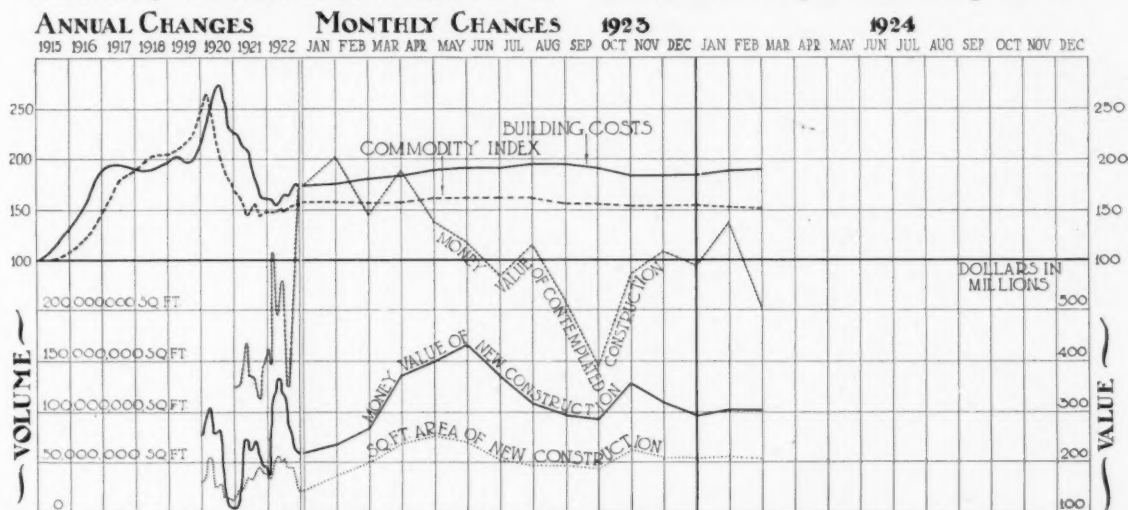
## The Building Situation

ACCORDING to reports of the F. W. Dodge Company the value of building contracts let in February amounted to approximately \$300,000,000. It decreased only about 1 per cent from the record month preceding and increased 7 per cent over February of last year, while January showed an increase of 23 per cent over January, 1923. Thus we enter the year at a considerably greater momentum of actual construction business than in any preceding year, and at present the spring construction season promises an unprecedented volume. It is but natural to expect that there will be some price reaction as a result of this situation, and an upward trend has been noticeable during March. Spring activity will probably carry on to a peak of contracts let in May or June, with a seasonal falling off of contract letting during the remainder of the summer, and as business conditions are basically good, there will probably be a secondary wave of activity in the fall. Unless some unusual condition, such as a buyers' strike, develops, it is quite likely that the index line, "Monthly Value of New Construction," will follow in 1924 a course similar

to that of 1923, but indicating a greater volume.

The contemplated new work as represented by "Plans Filed" throughout the country shows a decrease in February as compared with January, but an upward reaction is anticipated during March, although many prospective buyers of building materials are hesitating about going into the market, waiting to see what the reaction of the heavy program of winter building is to be. There is apparently no falling off of interest on the part of speculative and investment builders, and mortgage money is increasing in available volume rather than decreasing.

Direct reports to THE ARCHITECTURAL FORUM from architects in various sections of the country indicate that a large number of interesting plans are under active development and consideration, and it is probable that a great volume of business will come into the market during the next three or four months. Reports from large cities show an increasing number of apartment vacancies, although no decrease in rentals is indicated, and it is evident that this condition has not caused speculative builders to withdraw from the apartment building market.



THESE various important factors of change in the building situation are recorded in the chart given here: (1) *Building Costs*. This includes the cost of labor and materials; the index point is a composite of all available reports in basic materials and labor costs under national averages. (2) *Commodity Index*. Index figure determined by the United States Department of Labor. (3) *Money Value of Contemplated Construction*. Value of building for which plans have been filed based on reports of the United States Chamber of Commerce, F. W. Dodge Co., and *Engineering News-Record*. (4) *Money Value of New Construction*. Total valuation of all contracts actually let. The dollar scale is at the right of the chart in millions. (5) *Square Foot Area of New Construction*. The measured volume of new buildings. The square foot measure is at the left of the chart. The variation of distances between the value and volume lines represents a square foot cost which is determined first, by the trend of building costs, and second, by the quality of construction.



## Unaffected by sulphuric fumes!

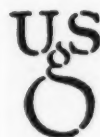
The presence of corrosive fumes in foundries, forge shops, power plants and other buildings makes a roof deck of Pyrobar Gypsum Tile doubly necessary.

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